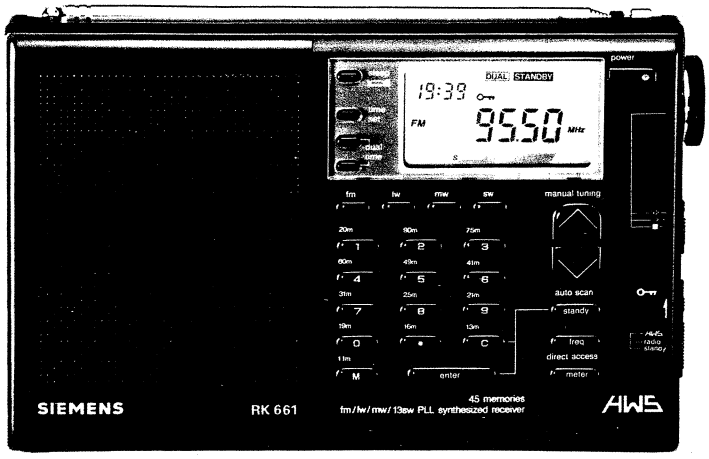
SIEMENS

Weltempfänger RK661G4
World Band Receiver RK661G4



Kundendienstschrift
Service manual

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Ausgabe / Issue 026

Ident-Nr. / Order-no. 53 5325

ALLGEMEINE TECHNISCHE ANGABEN

Netzteil

Energieversorgung:
1) für Radio
   4 × 1,5 V Mignonzellen
   IEC R6, AA
2) für Uhr
   2 × 1,5 Mignonzellen
   IEC R6, AA
3) 6 V durch Ext. Netzteil
   Ident-Nr. 75 6821

Geringste zulässige Batteriespannung: 4,2 V

Maximale Leistungsaufnahme: 1,3 W

Tuner

Wellenbereiche:
UKW 87,5 ... 108 MHz
MW 150 ... 519 kHz
LW 520 ... 1620 kHz
KW 1,621 ... 29,999 MHz

Abstimmschritte:

Wellenbereiche	Elektronisch	Handabstimmung
UKW	50 kHz	50/100 kHz
MW	9 kHz	9 kHz/1 kHz
LW	9 kHz	9 kHz/1 kHz
KW	5 kHz	5 kHz/1 kHz

Empfindlichkeit:
UKW (S/R = 30 db) < 15,9 µV (EMK)
MW (S/R = 20 db) < 1,59 mV
LW (S/R = 20 db) < 4 mV
KW (S/R = 20 db) < 25,1 µV (EMK)

Stop-Pegel:
UKW 15,9 µV (EMK)
MW 794 µV
LW 2,51 mV
KW 20 µV (EMK)

Zwischenfrequenzen:
FM 10,7 MHz
AM 450 kHz
AM 55845 kHz

Verstärker

NF-Ausgangsleistung (Kges = 10 %): = 340 mW

Anschlüsse

Buchse	Eingang/ Ausgang/ Typ	Impedanz	Pegel
AM EXT ANT	E/Ø 3,5	–	–
Kopfhörer	A/Ø 3,5	32 Ω	
Netz	E	(250 mA)	6 V (Mitte = –)

GENERAL TECHNICAL DATA

Power supply unit

Power supply:
1) for Radio
   4 × 1.5 V cells
   IEC R6, AA
2) for clock
   2 × 1.5 cells
   IEC R6, AA
3) Via 6 V AC/DC adapter
   Ident-No. 75 6821

Lowest battery voltage: 4.2 V

Power consumption: 1.3 W

Tuner

Ranges:
FM 87.5 ... 108 MHz
MW 150 ... 519 kHz
LW 520 ... 1620 kHz
SW 1,621 ... 29,999 MHz

Tuning steps:

Range	Automatical alignment	Electronic alignment
FM	50 kHz	50/100 kHz
MW	9 kHz	9 kHz/1 kHz
LW	9 kHz	9 kHz/1 kHz
SW	5 kHz	5 kHz/1 kHz

Sensitivity:
FM (S/N = 30 db) < 15.9 µV (emf)
MW (S/N = 20 db) < 1.59 mV
LW (S/N = 20 db) < 4 mV
SW (S/N = 20 db) < 25.1 µV (emf)

Stop-level:
FM 15.9 µV (emf)
MW 794 µV
LW 2.51 mV
SW 20 µV (emf)

Intermediate Frequency:
FM 10.7 MHz
AM 450 kHz
AM 55845 kHz

Amplifier

AF-Power output (T.H.D. = 10 %): = 340 mW

Connections

Socket	Input/ Output/ Type	Impedance	Level
AM EXT ANT	I/Ø 3.5	–	–
Phones	O/Ø 3.5	32 Ω	
Power	I	(250 mA)	6 V (Center = –)

Hinweise

1. Fehler in der Bedienungsanleitung, Ident-Nr. 53 0601 (Erstdruck).

   Richtig auf der Seite Bedienungselemente:

   20 = FM Stereo/Mono und AM Nah/Weit

   21 = Kopfhörerbuchse

   25 = Abstimmgeschwindigkeit

   26 = Elektronische Verriegelung

   27 = HWS/Radio

   28 = Lautstärke

2. Deprogrammierung der Weckzeit

2.1 Auf die Stand-by-Taste drücken.

2.2 Auf die C-Taste drücken.
Die zuletzt einprogrammierte Weckzeit wird noch angezeigt, es wird aber nicht mehr geweckt.

3. Senderspeicherung mit und ohne Stützbatterie

   Nur bei der ersten Liefercharge war für die Erhaltung der Sender eine Stützbatterie erforderlich.

4. Speicherbelegung

4.1 Der Speicherbelegungsplan auf der Verpackung ist fehlerhaft.

4.2 Es sind die folgenden Sender gespeichert:

1.	Deutsche Welle	6,075 MHz
2.	Deutsche Welle	9,545 MHz
3.	Deutsche Welle	3,995 MHz
4.	Deutsche Welle	15,245 MHz
5.	Bayerischer Rundfunk	6,085 MHz
6.	Südwestfunk SWF3	7,265 MHz
7.	Austria International	6,155 MHz
8.	Austria International	13,730 MHz
9.	Radio Luxemburg	6,090 MHz

5. Erwärmung der Batterien und des externen Netzteiles

   Fehler: Bei Defekt (Kurzschluß) der Diode D28 erwärmen sich die Batterien und das externe Netzteil.

   Abhilfe: Die Diode D28 ausbauen. Nicht ersetzen.

Hints

1. Correction of instruction manual, Ident-No. 53 0601 (first print).

   Correct on page control locations:

   20 = FM Stereo/Mono and AM Narrow/Wide

   21 = Head phone jack

   25 = Tuning speed control

   26 = Lock

   27 = HWS/Radio

   28 = Volume

2. Deprogramming of wake up time

2.1 Press the stand-by-key.

2.2 Press the C-key.
The deprogrammed wake up time indicated on the display, but no alarm setting.

3. Preset with and without buffer batteries

   Only for the first delivery charge buffer battery had been necessary.

4. Programmed preset stations

4.1 The preset table printed on the packing is not correct.

4.2 The following stations stored in the RK661 preset:

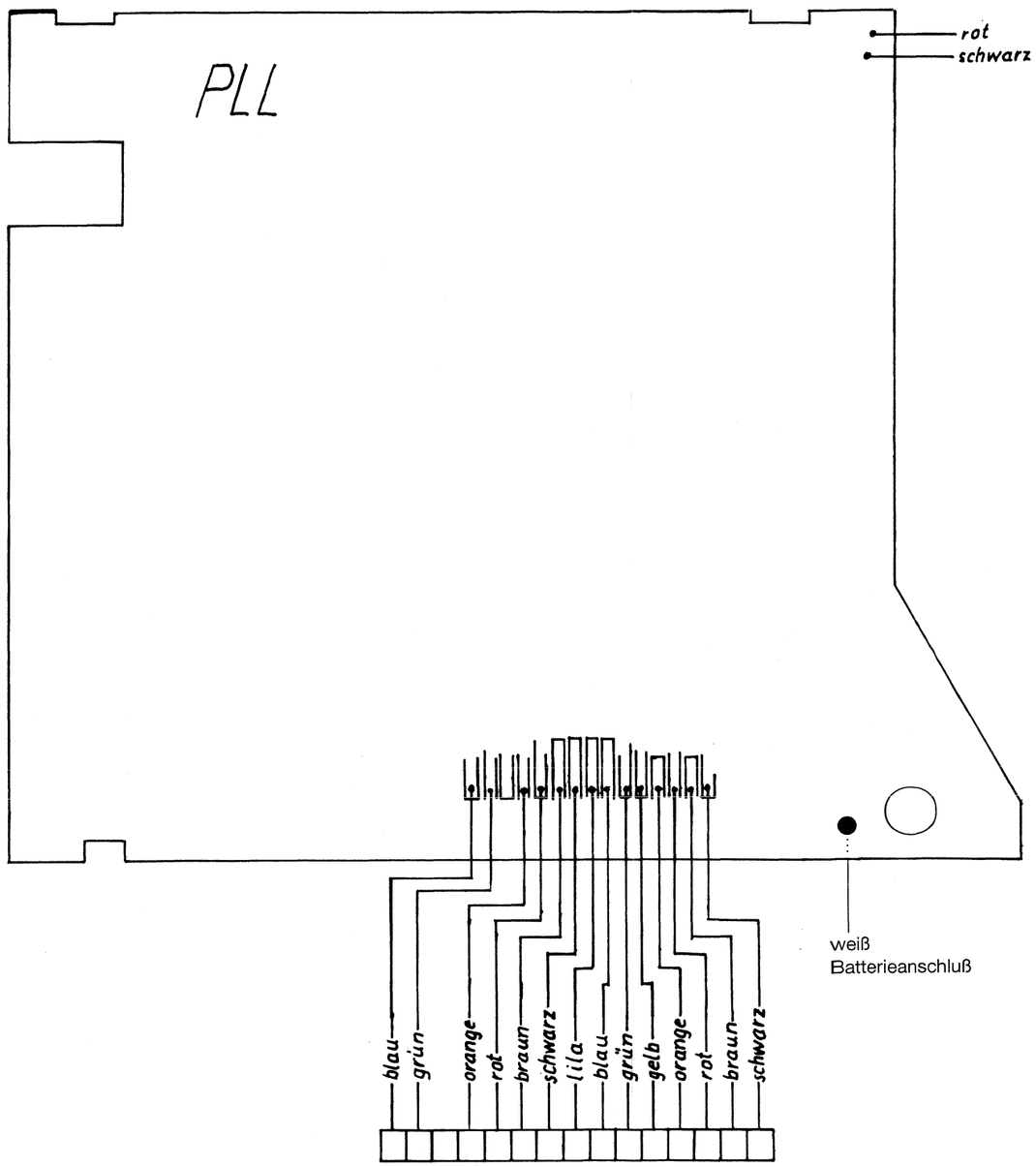
01	Radio France International	6.175 MHz
02	Radio France International	7.145 MHz
03	Radio Nederland	5.955 MHz
04	Radio Nederland	9.775 MHz
05	Swiss Radio International	6.165 MHz
06	Swiss Radio International	3.985 MHz
07	Radio Vatikan	9.645 MHz
08	RAI Italia	9.575 MHz
09	BBC World Service	6.195 MHz

5. If batteries and AC/DC adapter heats

   Fault: When diode D28 defectiv (short), the batteries and the AC/DC-adapter heat.

   Corrective action: Delete the diode D28. Don't remove!

Verdrahtung der PLL-Platine
Wiring of PLL-p.c.b.

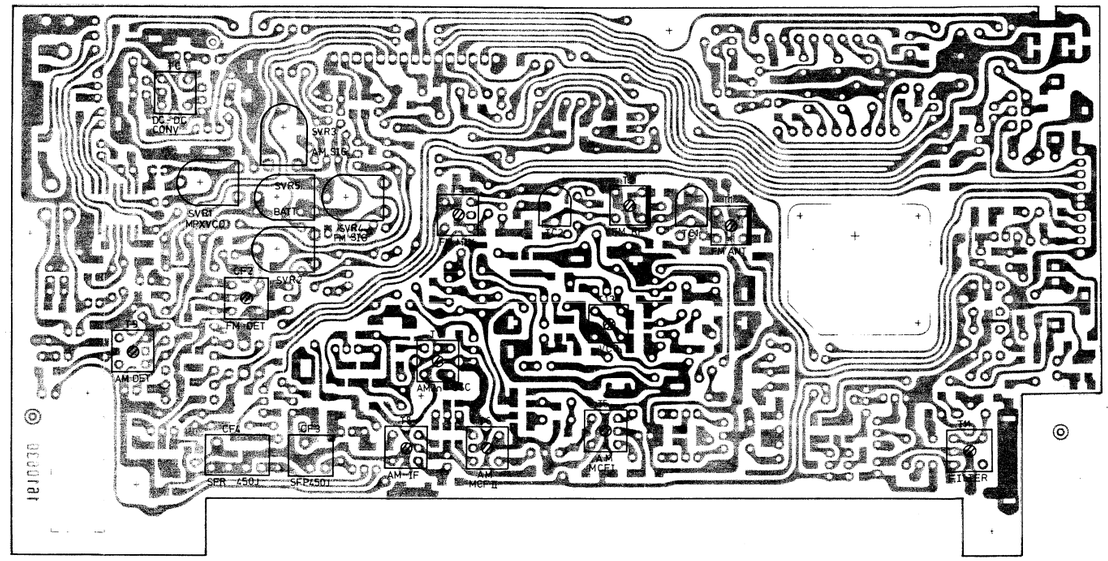


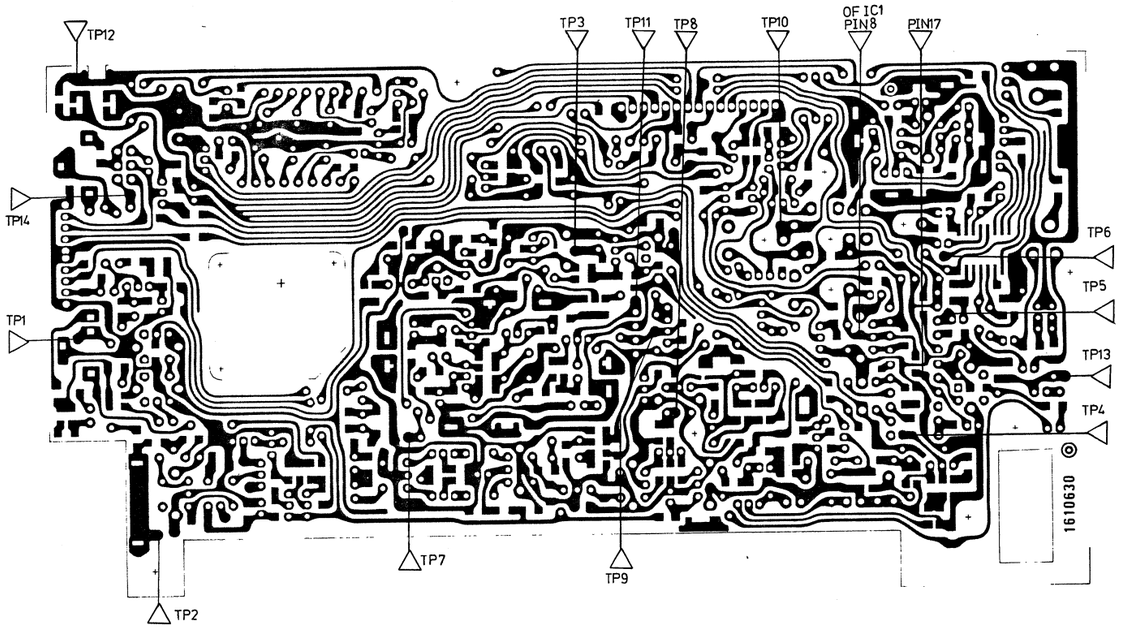
Abgleich

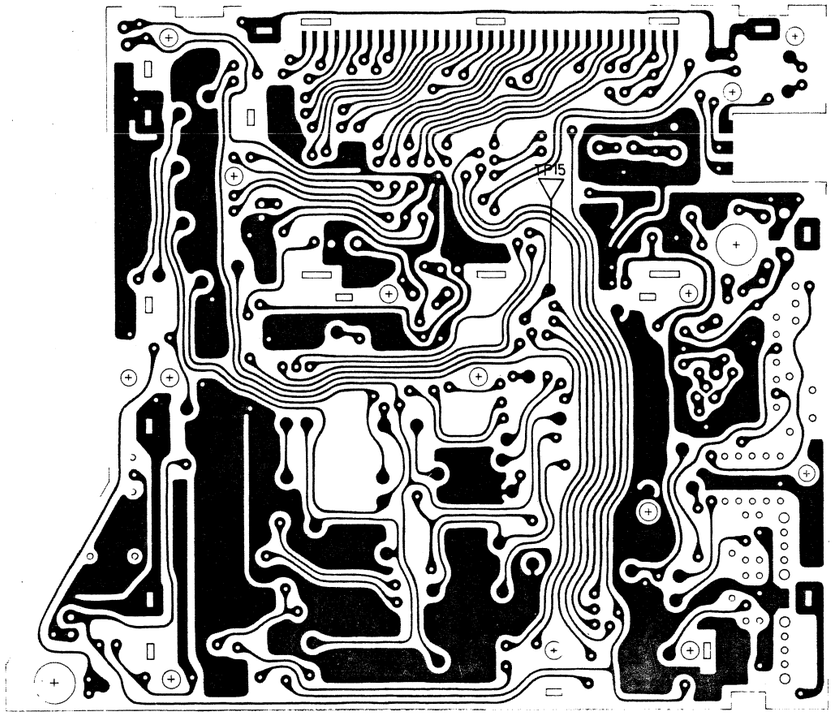
Schritt	Funktion	Vorbereitung	Signaleingang	Einstell-element	Meßwert
1.	Uhrentakt/ Referenzfrequenz	Frische Batterien verwenden. Den „sleep-modus" einstellen. Den Schalter „Lock" aufwärts stellen (alle Eingabetasten sind blockiert). Die vier Mignonzellen dem Radio-Batteriefach entnehmen. Einen Frequenzzähler an TP15 (Pin 48, IC205) und Masse anschließen.	–	TC202	524288 ± 4 Hz
2.	PLL-Referenz-frequenz	Das Radio einschalten. Das Geräte-Display auf 108 MHz stellen. Einen Frequenzzähler an TP7 und Masse anschließen. Der Massepunkt soll so nahe wie möglich an TP7 liegen	–	TC201	118,69975 + 0,0005 MHz
3.	2. AM-Oszillator	Das Radio einschalten. AM-Frequenz am Display so einstellen, daß keine Station vorhanden ist. Frequenzzähler an TP8 und Masse anschließen.	–	T7	55,39485 + 0,0003 MHz
4.	2. AM-ZF Abgleich mehrmals wiederholen	Das Radio einschalten. Den AM-Schalter auf WIDE stellen. Den Wobbelgeneratoreingang über einen 10 µF-Kondensator an TP5 und Masse anschließen. Den Wobbelgeneratorausgang über einen 0,1 µF-Kondensator an TP8 und Masse anschließen.	Um 450 kHz wobbeln	T8 T9	Maximum Maximum
5.	FM-ZF	Das Radio einschalten. Den Wobbelgeneratoreingang über einen 1,2 kΩ-Widerstand an TP5 und Masse anschließen. Den Wobbelgeneratorausgang über einen 2,2 kΩ-Widerstand an TP3 und Masse anschließen.	Um 10,7 MHz wobbeln	T3/T10	Max. symmetrische S-Kurve mit 0-Durchgang bei 10,7 MHz
6.	AM-Empfindlichkeit/Abgleich mehrmals wiederholen.	Radio einschalten. AM-Schalter auf WIDE stellen. AM-SENS-Schalter auf DX stellen. Das RK661-Display auf 15,100 MHz stellen. Abgleichsender an TP1 und Masse anschließen. Voltmeter (10 M) an TP14 (Lautspr.) und Masse anschließen. Frequenzzähler an TP4 und Masse anschließen.	15,100 MHz/1 kHz/ 30 % 	T5/T6 T7	Max. 1 kHz-Pegel 450 kHz ± 0,15 kHz
7.	FM-Empfindlichkeit/Abgleich mehrmals wiederholen	Radio einschalten. Voltmeter an TP14 (Lautspr.) und Masse anschließen. Abgleichsender an TP2 und Masse anschließen. RK661-Display auf 90 MHz stellen. RK661-Display auf 106 MHz stellen.	 90 MHz/40 kHz/1 kHz 106 MHz/40 kHz/1 kHz	 T1/T2 TC1/TC2	 Max. 1 kHz-Pegel Max. 1 kHz-Pegel
8.	Pilotton	Radio einschalten. FM-Schalter auf Stereo stellen. Blindklinkenstecker in die Kopfhörerbuchse stecken. Als Meßanordnung einen 1 µF-Kondensator von TP5 nach Masse schalten. Einen Frequenzzähler an TP6 und Masse anschließen.	–	SVR1	18,95 + 0,1 kHz
9.	Spannungs-versorgung	Die vier Mignonzellen dem Radio-Batteriefach entnehmen. Ext. Netzgerät an TP12 und Masse anschließen.	4,4 V⎓	SVR5	Batterieanzeige im Display auf 5 (beim Ausschalten)
10.	FM-Feldstärke	Radio einschalten. Abgleichsender an TP2 und Masse anschließen.	98 MHz/40 kHz/1 kHz 31,5 µV	SVR4	„6" auf der Feldstärke-skala im Display

Abgleich

Schritt	Funktion	Vorbereitung	Signaleingang	Einstell-element	Meßwert
11.	AM-Feldstärke	Radio einschalten. Den AM-Schalter auf WIDE stellen. Den AM-SENS-Schalter auf DX stellen. Das RK661-Display auf 15,100 MHz stellen. Abgleichsender an die grüne AM-Antennenbuchse anschließen.	15,100 MHz/30 %/ 1 kHz 31,5 µV	SVR3	„5" auf der Feldstärke-skala im Display
12.	ZF-Falle	Radio einschalten. Den AM-Schalter auf WIDE stellen. Den AM-SENS-Schalter auf DX stellen. RK661-Display auf 450 kHz stellen. Abgleichsender an die Ferritantenne ankoppeln (20 W). Voltmeter an TP14 (Lautspr.) und Masse anschließen.	450 kHz/30 %/1 kHz	T11	Min. 1 kHz-Pegel
13.	FM-Stop	Radio einschalten. Voltmeter parallel zum R88 (IC1, Pin 8, Pin 17) anschließen. Abgleichsender an TP2 und Masse anschließen. RK661-Display auf 98 MHz stellen.	98 MHz/30 %/1 kHz 1 mV	SVR2	< 0,3 V





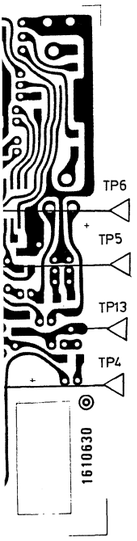


Alignment

Step	Function	Preparation	Signal input	Adjusting element	Indicated value
1.	Clock time accuracy	Load in fresh batteries. Set to "sleep on mode". Set the lock switch upward (electrically lock of all push buttons). Unload the four cells from the radio battery compartment. Connect frequency counter to TP15 (IC205, Pin 48) and ground.	–	TC202	524288 ± 4 Hz
2.	PLL-frequency	Set radio to on position. Set the RK661-display to 108 MHz. Connect frequency counter to TP7 and ground. The ground point should be as near as possible to testpoint TP7.	–	TC201	118.69975 + 0.0005 MHz
3.	2nd AM-oscillator	Set radio to on position. Set the RK661-display far away from any station to avoid interference. Connect frequency counter to TP8 and ground.	–	T7	55.39485 MHz + 0.0003 MHz
4.	2nd AM-IF, repeat adjustment several times	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position. Connect sweep generator input via 10 µF-capacitor to TP5 and ground. Connect sweep generator output via 0.1 µF capacitor to TP8 and ground.	Wobble at 450 kHz	T8 T9	Max. Max.
5.	FM-IF	Set radio to on position. Connect the sweep generator input via 1.2 kΩ resistor to TP5 and ground. Connect the sweep generator output via 2.2 kΩ resistor to TP3 and ground.	Wobble at 10.7 MHz	T3/T10	Max. symmetrical S-curve and zero axis cross at 10.7 MHz
6.	AM-sensitivity, repeat adjustment several times	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position. Set the AM sens switch to "DX" position. Set the RK661-display to 15.100 MHz. Connect RF-generator to TP1 and ground. Connect voltmeter (10 M) to TP14 (speaker) and ground. Connect frequency counter to TP4 and ground.	15.100 MHz/1 kHz/ 30 % 	T5/T6 T7	Max. 1 kHz level 450 kHz ± 0.15 kHz
7.	FM-sensitivity, repeat adjustment several times	Set radio to on position. Connect voltmeter to TP14 (speaker) and ground. Connect RF-generator to TP2 and ground. Set RK661-display to 90 MHz. Set RK661-display to 106 MHz.	90 MHz/40 kHz/1 kHz 106 MHz/40 kHz/1 kHz	T1/T2 TC1/TC2	Max. 1 kHz level Max. 1 kHz level
8.	Pilot	Set radio to on position. Set FM mode switch to "STEREO" position. Insert a plug of headphone into the headphone jack. Connect measure capacitor (1 µF) from TP5 to ground. Connect frequency counter from TP6 to ground.	–	SVR1	18.95 + 0.1 kHz
9.	Level of battery, indicated	Unload the batteries from radio battery compartment. Connect DC power supply to TP12 and ground. Set radio to on position.	4.4 V _	SVR5	Full (5) LCD-indication when power off
10.	FM-signal strength level	Set radio to on position. Connect RF-generator to TP2 and ground.	98 MHz/40 kHz/1 kHz 31.5 µV (63.1 µV-EMK)	SVR4	6th scale on LCD

Alignme

Step	F
11.	A I
12.	I 4
13.	I



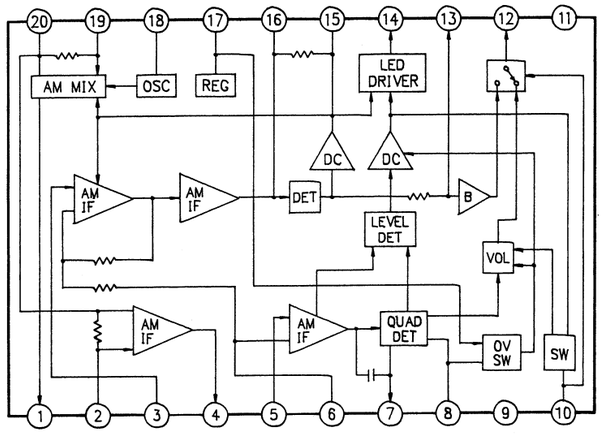
Alignment

Step	Function	Preparation	Signal input	Adjusting element	Indicated value
1.	Clock time accuracy	Load in fresh batteries. Set to "sleep on mode". Set the lock switch upward (electrically lock of all push buttons). Unload the four cells from the radio battery compartment. Connect frequency counter to TP15 (IC205, Pin 48) and ground.	–	TC202	524288 ± 4 Hz
2.	PLL-frequency	Set radio to on position. Set the RK661-display to 108 MHz. Connect frequency counter to TP7 and ground. The ground point should be as near as possible to testpoint TP7.	–	TC201	118.69975 + 0.0005 MHz
3.	2nd AM-oscillator	Set radio to on position. Set the RK661-display far away from any station to avoid interference. Connect frequency counter to TP8 and ground.	–	T7	55.39485 MHz + 0.0003 MHz
4.	2nd AM-IF, repeat adjustment several times	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position. Connect sweep generator input via 10 µF-capacitor to TP5 and ground. Connect sweep generator output via 0.1 µF capacitor to TP8 and ground.	Wobble at 450 kHz	T8 T9	Max. Max.
5.	FM-IF	Set radio to on position. Connect the sweep generator input via 1.2 kΩ resistor to TP5 and ground. Connect the sweep generator output via 2.2 kΩ resistor to TP3 and ground.	Wobble at 10.7 MHz	T3/T10	Max. symmetrical S-curve and zero axis cross at 10.7 MHz
6.	AM-sensitivity, repeat adjustment several times	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position. Set the AM sens switch to "DX" position. Set the RK661-display to 15.100 MHz. Connect RF-generator to TP1 and ground. Connect voltmeter (10 M) to TP14 (speaker) and ground. Connect frequency counter to TP4 and ground.	15.100 MHz/1 kHz/ 30 % 	T5/T6 T7	Max. 1 kHz level 450 kHz ± 0.15 kHz
7.	FM-sensitivity, repeat adjustment several times	Set radio to on position. Connect voltmeter to TP14 (speaker) and ground. Connect RF-generator to TP2 and ground. Set RK661-display to 90 MHz. Set RK661-display to 106 MHz.	90 MHz/40 kHz/1 kHz 106 MHz/40 kHz/1 kHz	T1/T2 TC1/TC2	Max. 1 kHz level Max. 1 kHz level
8.	Pilot	Set radio to on position. Set FM mode switch to "STEREO" position. Insert a plug of headphone into the headphone jack. Connect measure capacitor (1 µF) from TP5 to ground. Connect frequency counter from TP6 to ground.	–	SVR1	18.95 + 0.1 kHz
9.	Level of battery, indicated	Unload the batteries from radio battery compartment. Connect DC power supply to TP12 and ground. Set radio to on position.	4.4 V _	SVR5	Full (5) LCD-indication when power off
10.	FM-signal strength level	Set radio to on position. Connect RF-generator to TP2 and ground.	98 MHz/40 kHz/1 kHz 31.5 µV (63.1 µV-EMK)	SVR4	6th scale on LCD

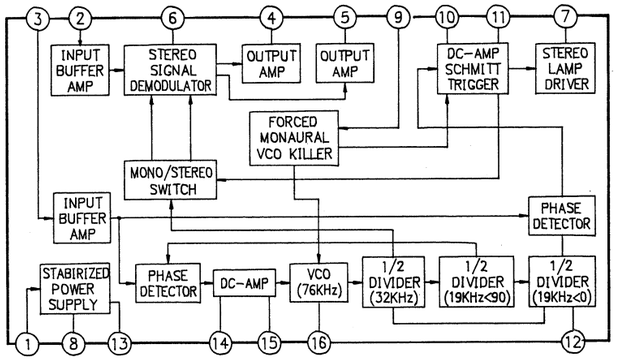
Alignment

Step	Function	Preparation	Signal input	Adjusting element	Indicated value
11.	AM-signal strength level	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position and AM-sens-switch to "DX" position. Set the RK661-display to 15.100 MHz. Connect the RF-generator to green AM-antenna socket (ext.).	15.100 MHz/30 %/ 1 kHz/31.5 µV	SVR3	5th scale on LCD
12.	IF trap coil, 450 kHz	Set radio to on position. Set the AM-bandwidth switch to "WIDE" position, and AM-sens-switch to "DX" position. Set RK661-display to 450 kHz. Couple RF-generator to bar-antenna (20 t). Connect voltmeter to TP14 (speaker) and ground.	450 kHz/30 %/1 kHz	T11	Min. 1 kHz-level
13.	FM-Stop	Set radio to on position. Connect voltmeter across R88 (IC1, pin 8, pin 17). Connect RF-generator to TP2 and ground. Set RK661-display to 98 MHz.	98 MHz/30 %/1 kHz 1 mV	SVR2	< 0.3 V

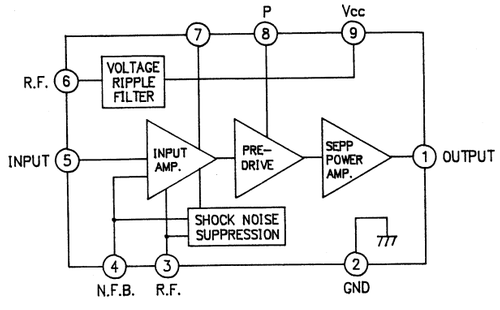
IC1-TA7758P



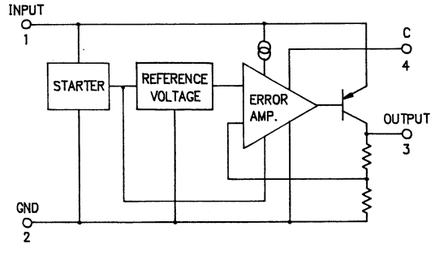
IC2-AN7415S



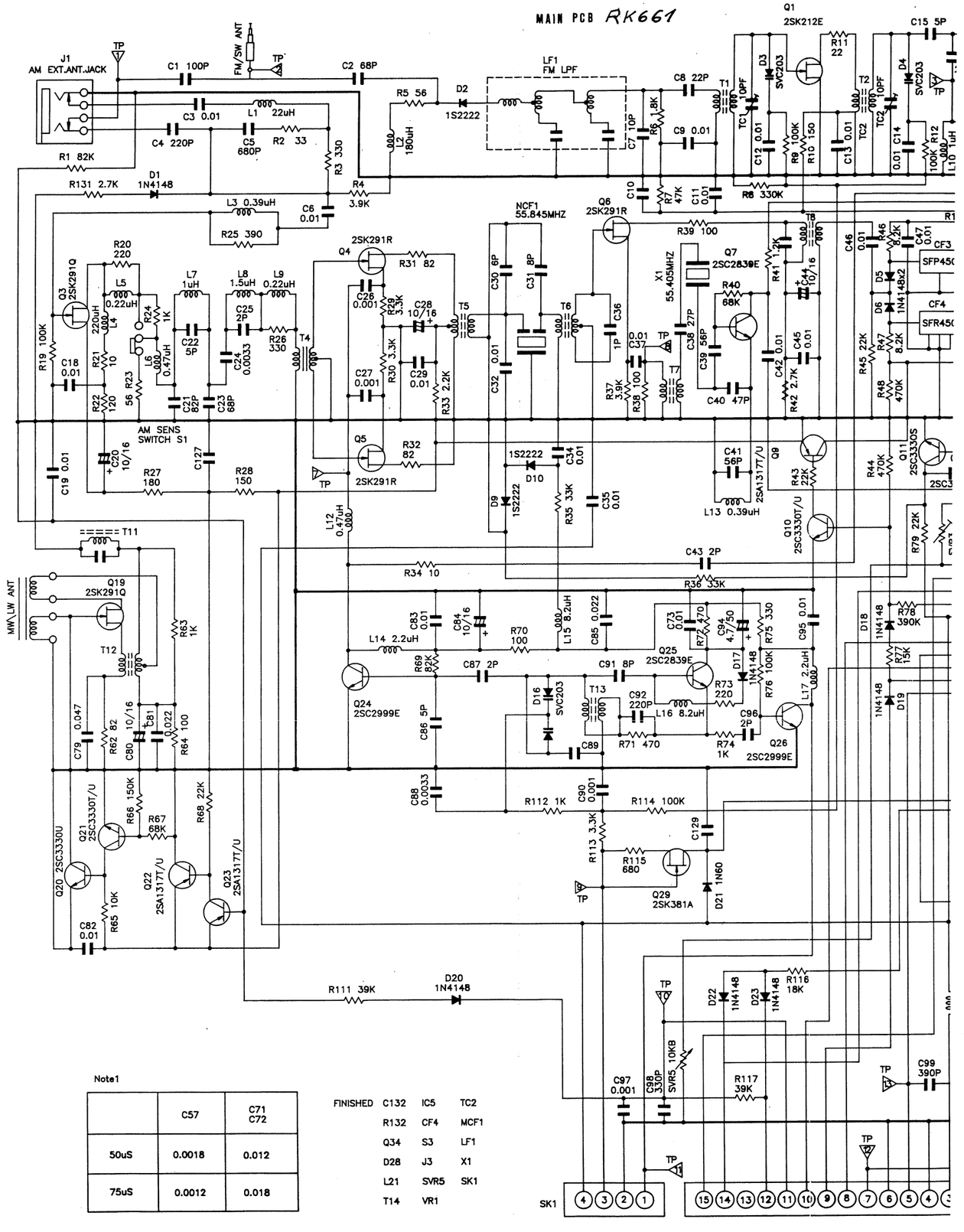
IC3,4-AN7117



IC5-LA5003



MAIN PCB RK661

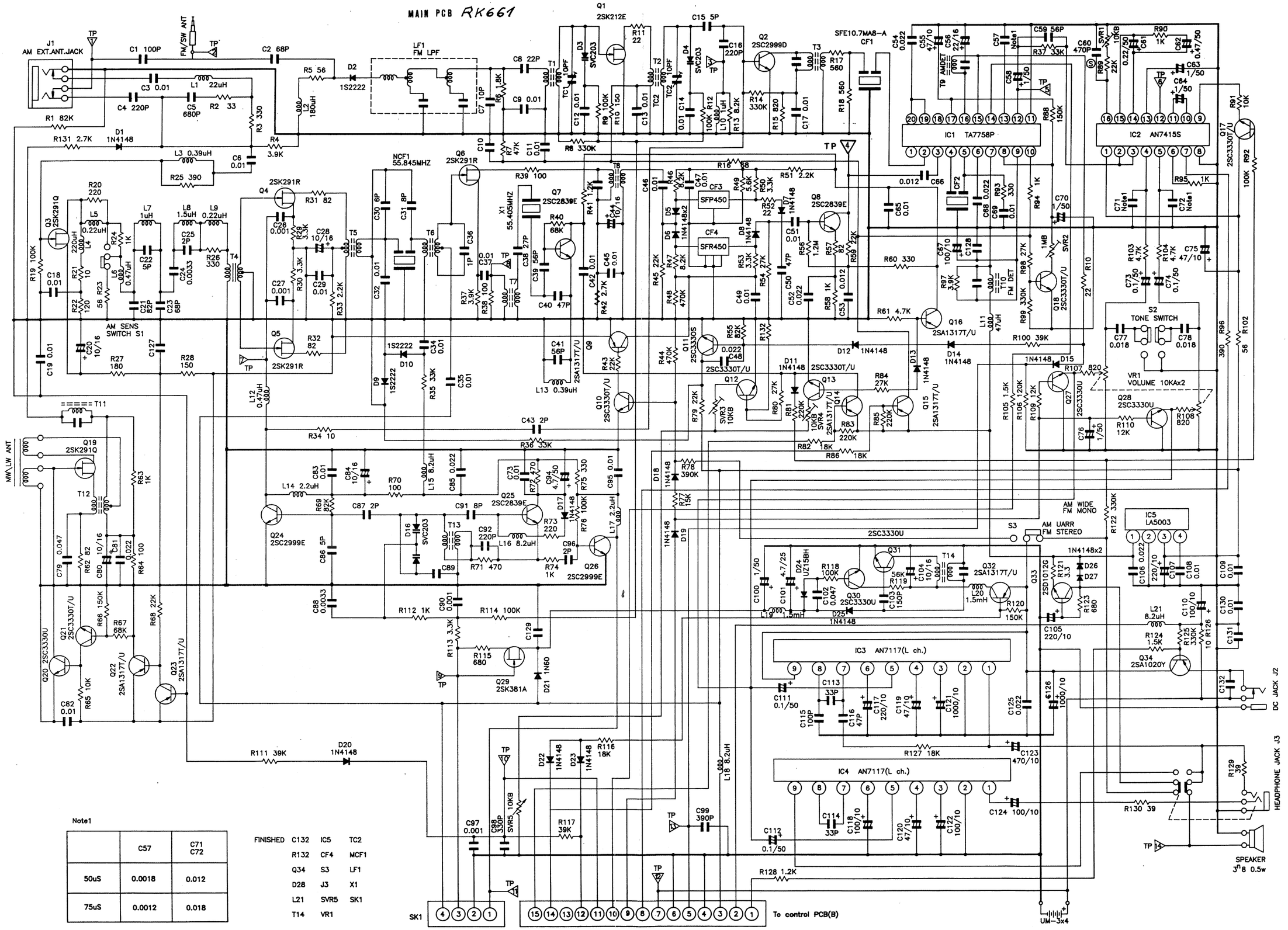


Note1

	C57	C71 C72
50uS	0.0018	0.012
75uS	0.0012	0.018

FINISHED	C132	IC5
	R132	CF4
	Q34	S3
	D28	J3
	L21	SVR5
	T14	VR1
	TC2	
	MCF1	
	LF1	
	X1	
	SK1	

MAIN PCB RK661

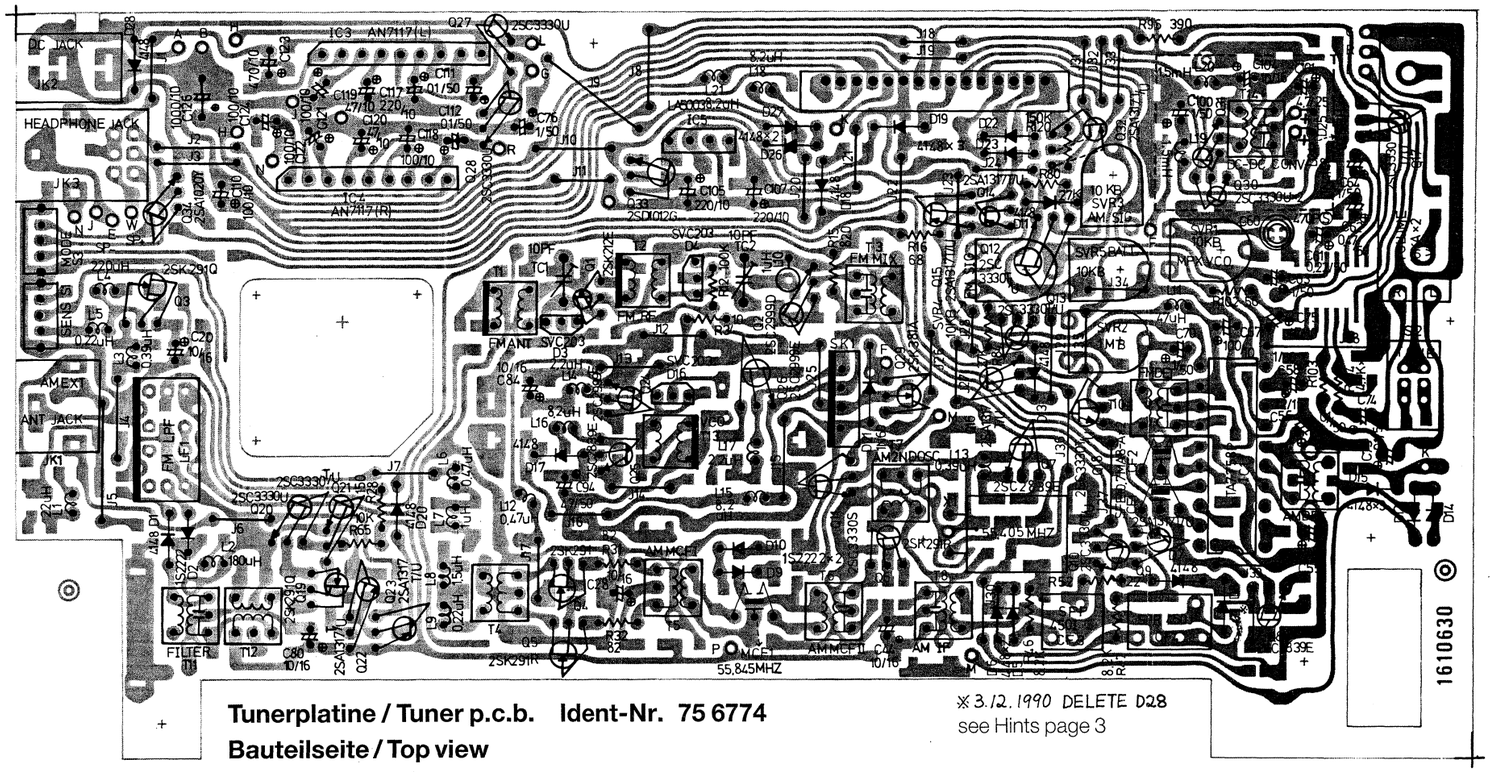


Note1

	C57	C71 C72
50uS	0.0018	0.012
75uS	0.0012	0.018

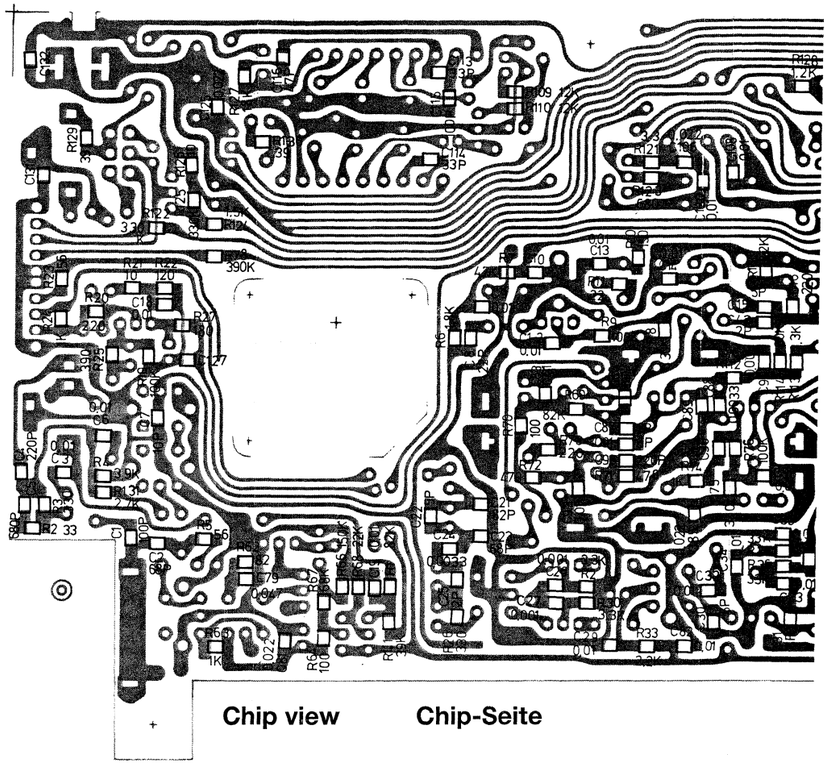
FINISHED

C132	IC5	TC2	
R132	CF4	MCF1	
Q34	S3	LF1	
D28	J3	X1	
L21	SVR5	SK1	
T14	VR1		

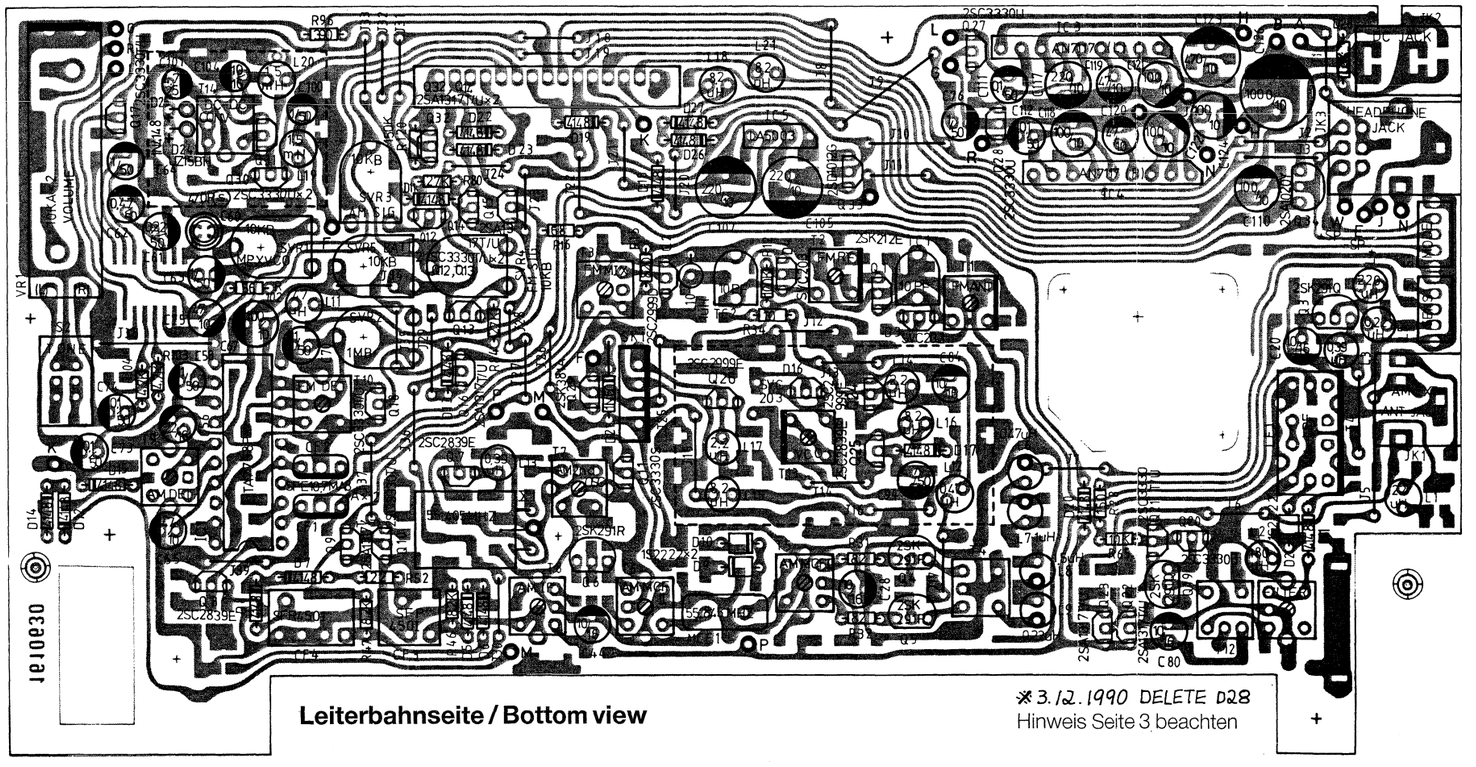


Tunerplatine / Tuner p.c.b. Ident-Nr. 75 6774
Bauteilseite / Top view

※3.12.1990 DELETE D28
see Hints page 3



Chip view Chip-Seite



Leiterbahnseite / Bottom view

※3.12.1990 DELETE D28
Hinweis Seite 3 beachten

IC-Spannungen / IC-Voltages

IC1

PIN NO.	FM	AM
1	4.39	3.80
2	1.66	1.66
3	1.83	1.60
4	1.27	1.79
5	1.38	1.60
6	1.38	1.60
7	5.04	4.99
8	2.60	2.25
9	5.04	4.99
10	4.93	0
11	0	0
12	1.50	1.59
13	0	2.35
14	2.97	2.97
15	1.12	1.08
16	1.12	1.08
17	2.38	2.33
18	1.77	1.46
19	1.66	1.66
20	1.66	1.66

IC2

PIN NO.	FM	AM
1	2.86	2.86
2	0.46	0.46
3	0.46	0.46
4	0.93	0.93
5	0.93	0.93
6	0.02	0.02
7	2.99	2.99
8	0	0
9	1.04	1.04
10	0.45	0.45
11	1.17	1.17
12	1.32	1.32
13	1.43	1.43
14	1.15	1.15
15	1.15	1.15
16	0.02	0.02

IC3

PIN NO.	FM	AM
1	2.76	2.76
2	0	0
3	2.76	2.76
4	2.75	2.75
5	2.74	2.74
6	5.92	5.92
7	4.65	4.65
8	3.34	3.34
9	5.97	5.97

IC4

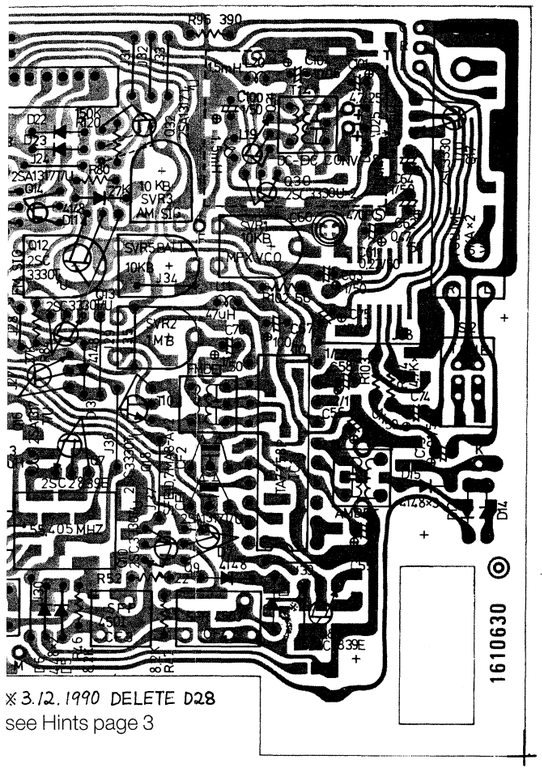
PIN NO.	FM	AM
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0

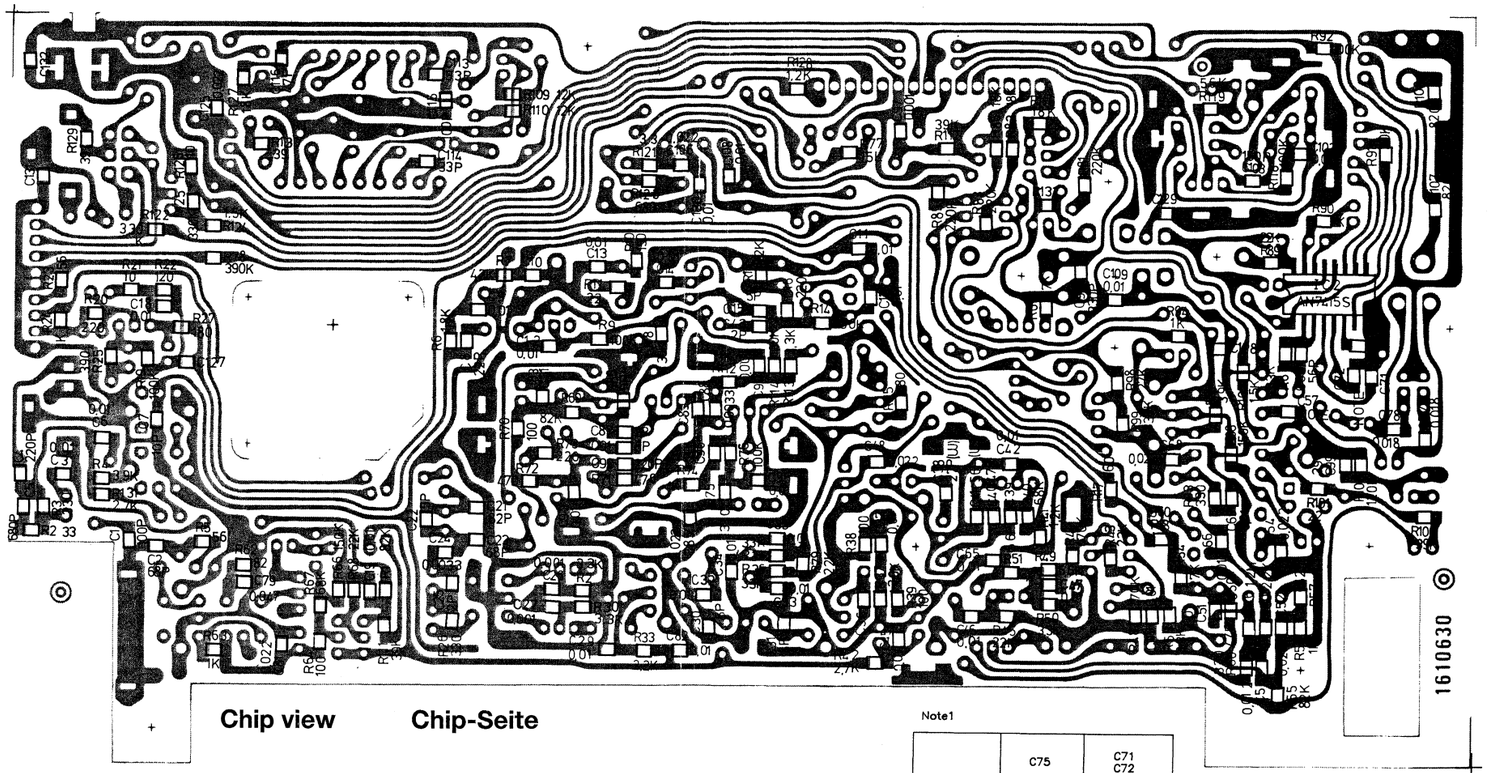
IC5

PIN NO.	FM	AM
1	5.05	5.00
2	0	0
3	3.00	3.00
4	4.30	4.25

Transistorspannungen
Transistor voltages

		FM
Q1	S	0
	G	0
	D	4.02
Q2	E	0
	B	0.65
	C	4.00
Q3	S	0
	G	0
	D	0
Q4	S	0
	G	0
	D	0
Q5	S	0
	G	0
	D	0



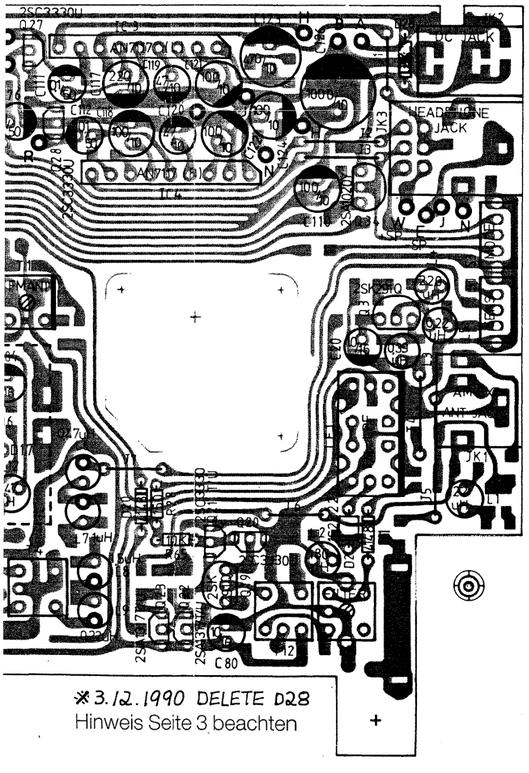


Chip view **Chip-Seite**

Note1

	C75	C71 C72
50uS	0.0018	0.012
75uS	0.0012	0.0018

		FM	AM
Q21	E	0	0
	B	0	0.64
	C	0	0.04
Q22	E	0	4.91
	B	0	4.22
	C	0	4.85
Q23	E	0	4.91
	B	0	4.78
	C	0	4.22
Q24	E	0	0
	B	0.75	0.75
	C	2.64	2.64
Q25	E	0.75	0.75
	B	1.40	1.40
	C	1.68	1.68
Q26	E	0	0
	B	0.74	0.74
	C	2.04	2.04
Q27	E	0	0
	B	0	0
	C	0	0
Q28	E	0	0
	B	0	0
	C	0	0
Q29	S	10.15	1.97
	G	9.97	1.78
	D	14.90	2.77
Q30	E	0	0
	B	0.53	0
	C	0.68	0
Q31	E	0	0
	B	0.68	0
	C	5.81	0
Q32	E	5.97	5.97
	B	5.27	5.96
	C	5.87	0
Q33	E	5.15	5.13
	B	5.84	5.83
	C	5.97	5.97
Q34	E	6.00	6.00
	B	5.31	5.31
	C	5.97	5.97



IC-Spannungen / IC-Voltages

IC1

PIN NO.	FM	AM
1	4.39	3.80
2	1.66	1.66
3	1.83	1.60
4	1.27	1.79
5	1.38	1.60
6	1.38	1.60
7	5.04	4.99
8	2.60	2.25
9	5.04	4.99
10	4.93	0
11	0	0
12	1.50	1.59
13	0	2.35
14	2.97	2.97
15	1.12	1.08
16	1.12	1.08
17	2.38	2.33
18	1.77	1.46
19	1.66	1.66
20	1.66	1.66

IC2

PIN NO.	FM	AM
1	2.86	2.86
2	0.46	0.46
3	0.46	0.46
4	0.93	0.93
5	0.93	0.93
6	0.02	0.02
7	2.99	2.99
8	0	0
9	1.04	1.04
10	0.45	0.45
11	1.17	1.17
12	1.32	1.32
13	1.43	1.43
14	1.15	1.15
15	1.15	1.15
16	0.02	0.02

IC3

PIN NO.	FM	AM
1	2.76	2.76
2	0	0
3	2.76	2.76
4	2.75	2.75
5	2.74	2.74
6	5.92	5.92
7	4.65	4.65
8	3.34	3.34
9	5.97	5.97

IC4

PIN NO.	FM	AM
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0

IC5

PIN NO.	FM	AM
1	5.05	5.00
2	0	0
3	3.00	3.00
4	4.30	4.25

Transistorspannungen
Transistor voltages

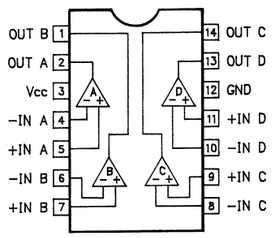
		FM	AM
Q1	S	0	0
	G	0	0
	D	4.02	0
Q2	E	0	0
	B	0.65	0
	C	4.00	0
Q3	S	0	0.43
	G	0	0
	D	0	3.85
Q4	S	0	0.92
	G	0	0
	D	0	3.55
Q5	S	0	0.92
	G	0	0
	D	0	3.55

		FM	AM
Q6	S	0	0.78
	G	0	0
	D	0	4.34
Q7	E	0	0
	B	0	0.65
	C	0	1.40
Q8	E	0	0.28
	B	0	0.93
	C	0	2.40
Q9	E	0	4.91
	B	0.01	4.35
	C	0	0.01
Q10	E	0	0
	B	0.56	0
	C	0.01	4.35
Q11	E	0	0
	B	0.29	0.29
	C	3.00	3.00
Q12	E	0	0
	B	0	0.66
	C	1.38	0.02
Q13	E	0	0
	B	0.66	0
	C	0.02	1.16

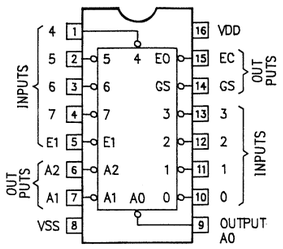
		FM	AM
Q14	E	5.05	5.00
	B	4.93	4.29
	C	0	4.91
Q15	E	5.05	5.00
	B	4.36	5.30
	C	4.99	0
Q16	E	3.00	3.00
	B	4.35	2.32
	C	0	2.98
Q17	E	2.85	2.85
	B	3.45	3.45
	C	2.86	2.86
Q18	E	0	0
	B	0.64	0
	C	0.01	2.25
Q19	S	0	0.37
	G	0	0
	D	0	4.20
Q20	E	0	0
	B	0	0.04
	C	0	0

IC201,202-TA75339F

(TOP VIEW)



IC203-TC40H148F



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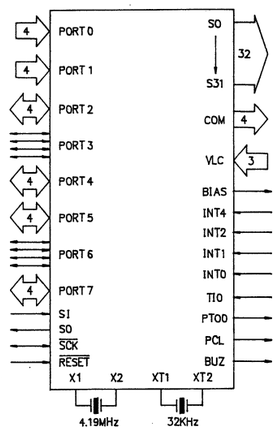

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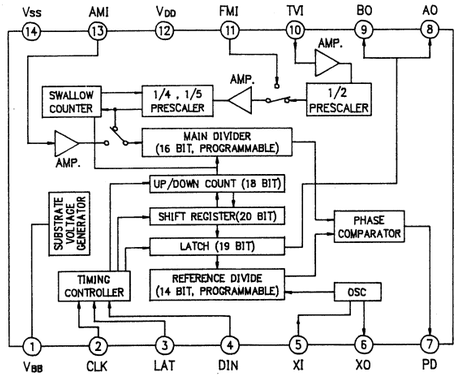


IC-Spannungen / IC-Voltages

IC201

PIN NO.	FM	AM
1	3.00	3.00
2	3.00	3.00
3	3.00	3.00
4	0.75	0.70
5	1.11	0.94
6	0.75	0.70
7	1.19	1.00
8	0.75	0.70
9	1.24	1.04
10	0.75	0.70
11	1.27	1.07
12	0	0
13	3.00	3.00
14	3.00	3.00

IC202

PIN NO.	FM	AM
1	3.00	3.00
2	3.00	3.00
3	3.00	3.00
4	0	0
5	1.05	0.88
6	0.75	0.70
7	0.94	0.79
8	0.75	0.70

IC203

PIN NO.	FM	AM
1	3.00	3.00
2	3.00	3.00
3	3.00	3.00
4	3.00	3.00
5	0	0
6	3.00	3.00
7	3.00	3.00
8	0	0
9	3.00	3.00
10	0	0
11	3.00	3.00
12	3.00	3.00
13	3.00	3.00
14	0	0
15	3.00	3.00
16	3.00	3.00

9	0.97	0.82
10	0.75	0.70
11	1.05	0.88
12	0	0
13	3.00	3.00
14	3.00	3.00

IC204

PIN NO.	FM	AM
1	-1.38	-1.37
2	0	0
3	0	0
4	3.00	3.00
5	1.20	1.20
6	1.11	1.11
7	0.68	0.69
8	0.01	0.01
9	0.01	0.01
10	0	0
11	1.40	1.39
12	2.88	2.88
13	0	0
14	0	0

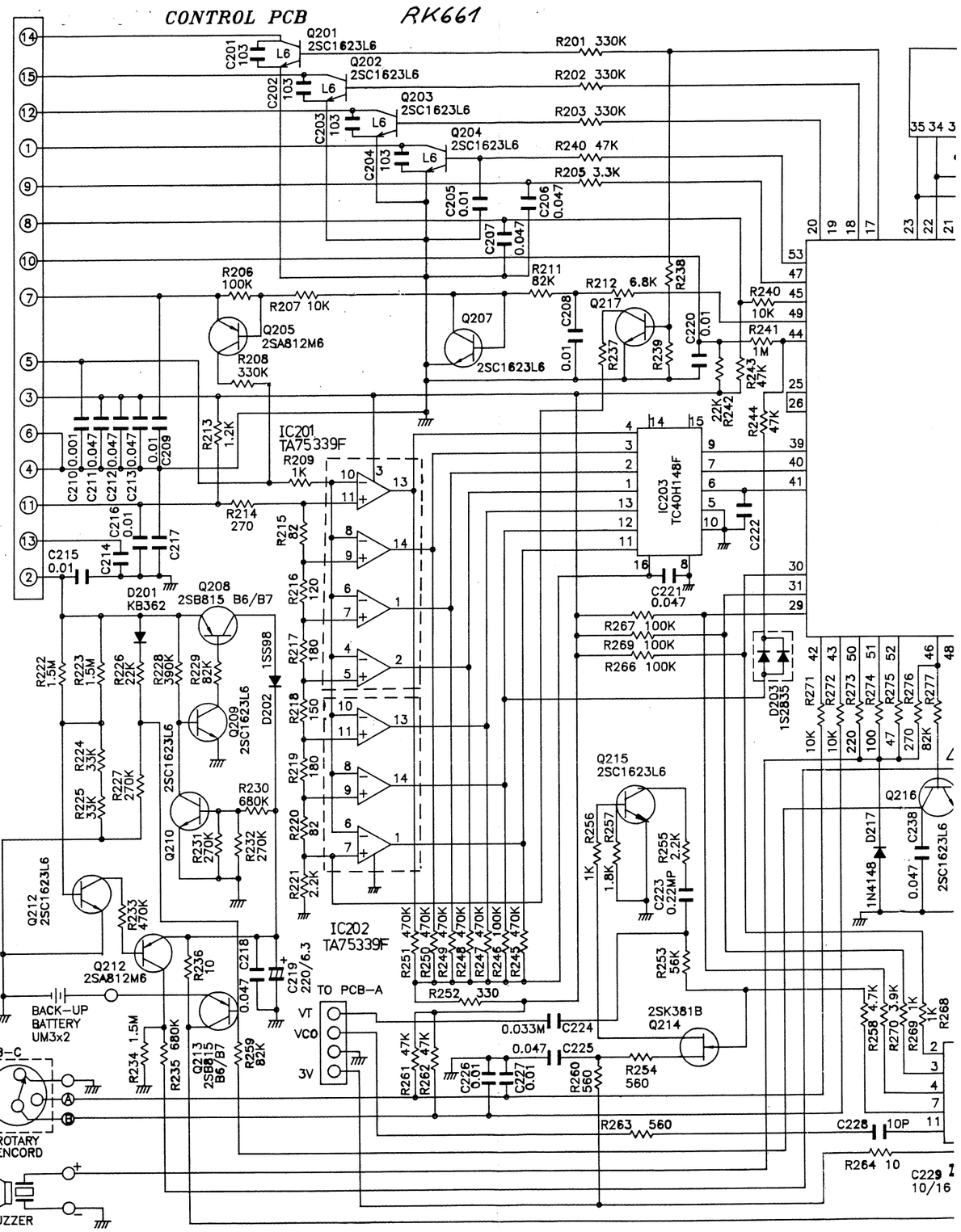
IC205

PIN NO.	FM	AM
1-15	LCD SEGMENT	
16	1.57	1.57
17	3.20	0
18	0	3.20
19	0	0
20	0	0

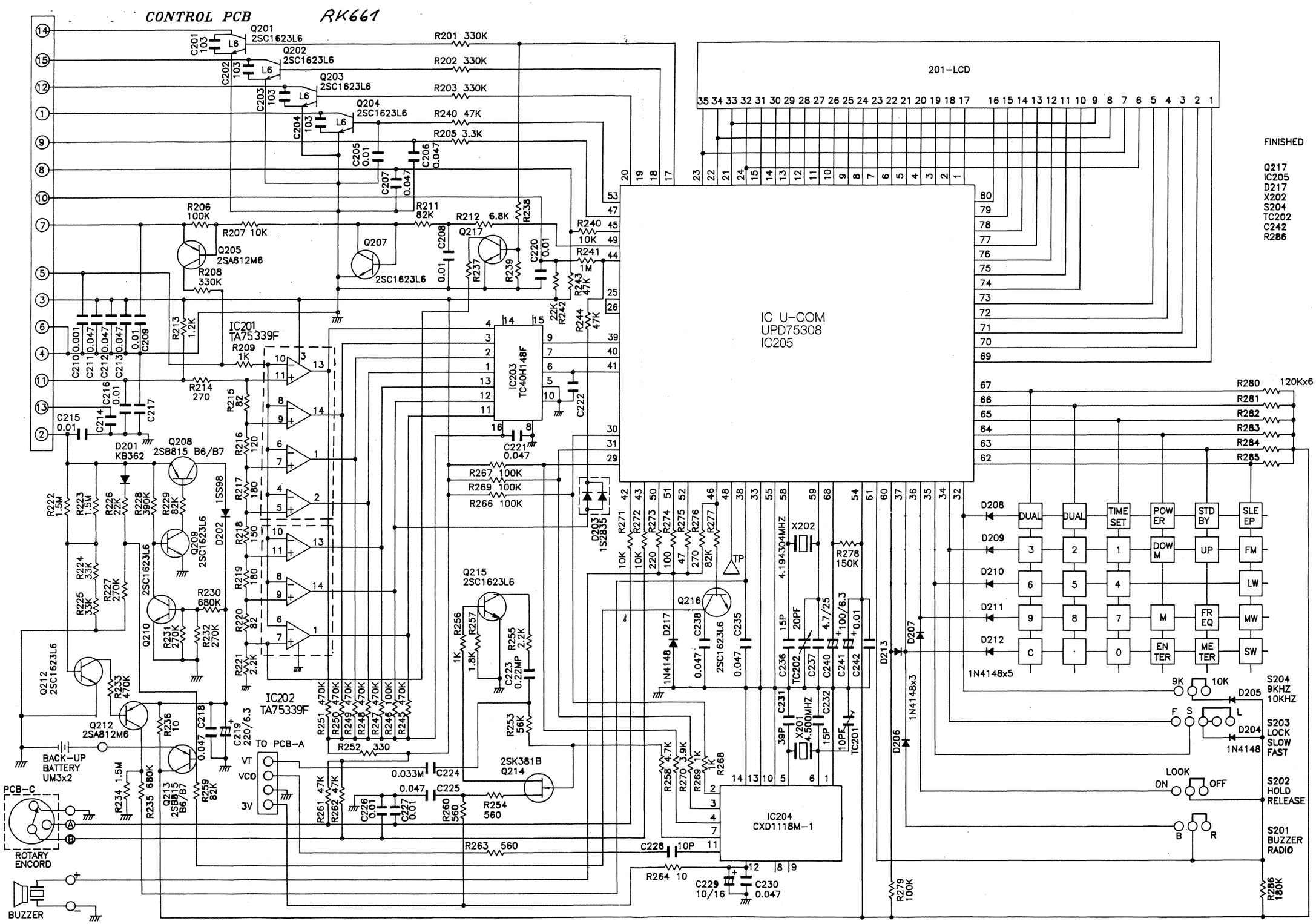
PIN NO.	FM	AM
21-24	LCD back plane	
25	3.22	3.22
26	3.22	3.22
27	2.15	2.15
28	1.08	1.08
29	3.00	3.00
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	3.00	3.00
38	3.20	3.20
39	3.00	3.00
40	3.00	3.00
41	3.00	3.00
42	3.00	3.00
43	3.00	3.00
44	3.00	3.00
45	3.00	3.00
46	0	0
47	0	0
48	0	0
49	0	0
50	0	0
51	0	0
52	0	0
53	3.22	3.22
54	3.22	3.22
55	0	0
56	3.22	3.22
57	0	0

PIN NO.	FM	AM
58	1.47	1.47
59	1.50	1.50
60	3.10	3.10
61	3.22	3.22
62	3.22	3.22
63	3.22	3.22
64	3.22	3.22
65	3.22	3.22
66	3.22	3.22
67	3.22	3.22
68	3.22	3.22
69-80	LCD SEGMENT	

CONTROL PCB RK661

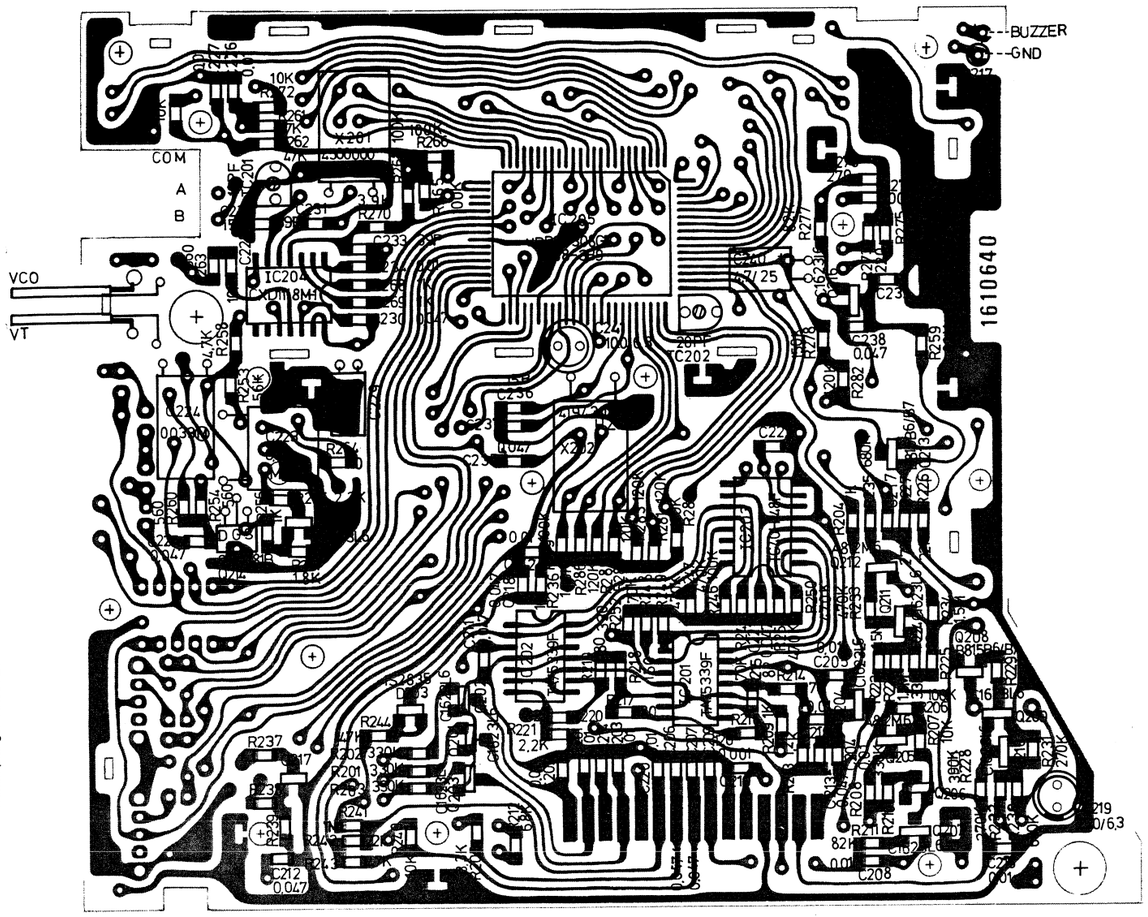


M	AM
47	1.47
50	1.50
10	3.10
22	3.22
22	3.22
22	3.22
22	3.22
22	3.22
22	3.22
22	3.22
22	3.22
D SEGMENT	

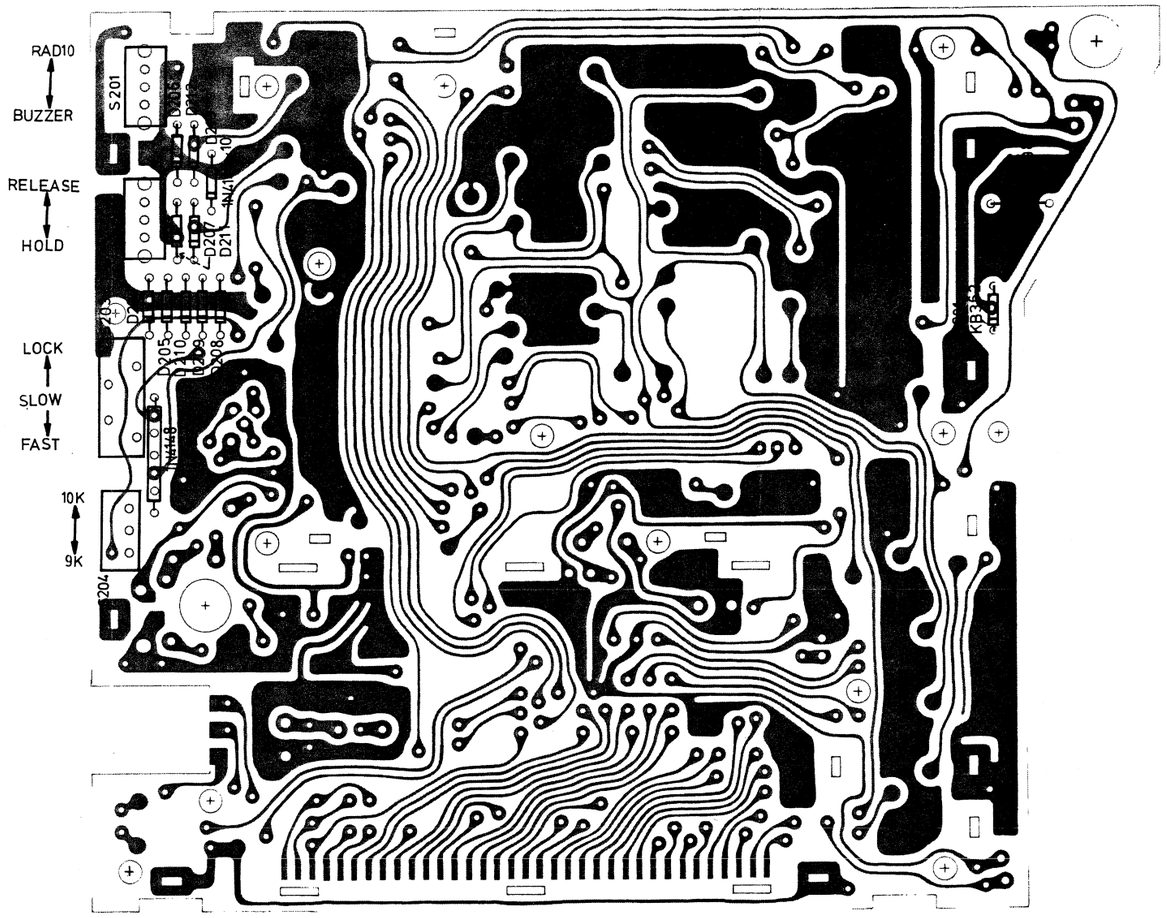


PLL-Platine / PLL-p.c.b.
Ident-Nr. 75 6783

Leiterbahnseite / Leiterbahnseite



Bauteilseite / Top view



Weltempfänger RK661G4

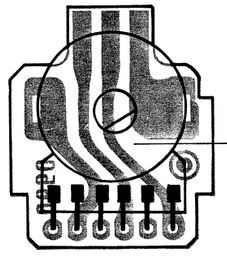
Transistorspannungen / Transistor voltages

		FM	AM
Q201	E	0	0
	B	0.61	0
	C	0.07	5.30
Q202	E	0	0
	B	0	0.61
	C	4.93	0.07
Q203	E	0	0
	B	0	0
	C	0.46	5.96
Q204	E	0	0
	B	0.66	0.66
	C	0.07	0.07
Q205	E	6.00	6.00
	B	6.00	6.00
	C	0.75	0.70

		FM	AM
Q207	E	0	0
	B	0	0
	C	6.00	6.00
Q208	E	6.00	6.00
	B	5.42	5.42
	C	3.52	3.52
Q209	E	0	0
	B	0.48	0.48
	C	5.32	5.32
Q210	E	0	0
	B	0.53	0.53
	C	0.48	0.48
Q211	E	0	0
	B	0.51	0.51
	C	1.35	1.35

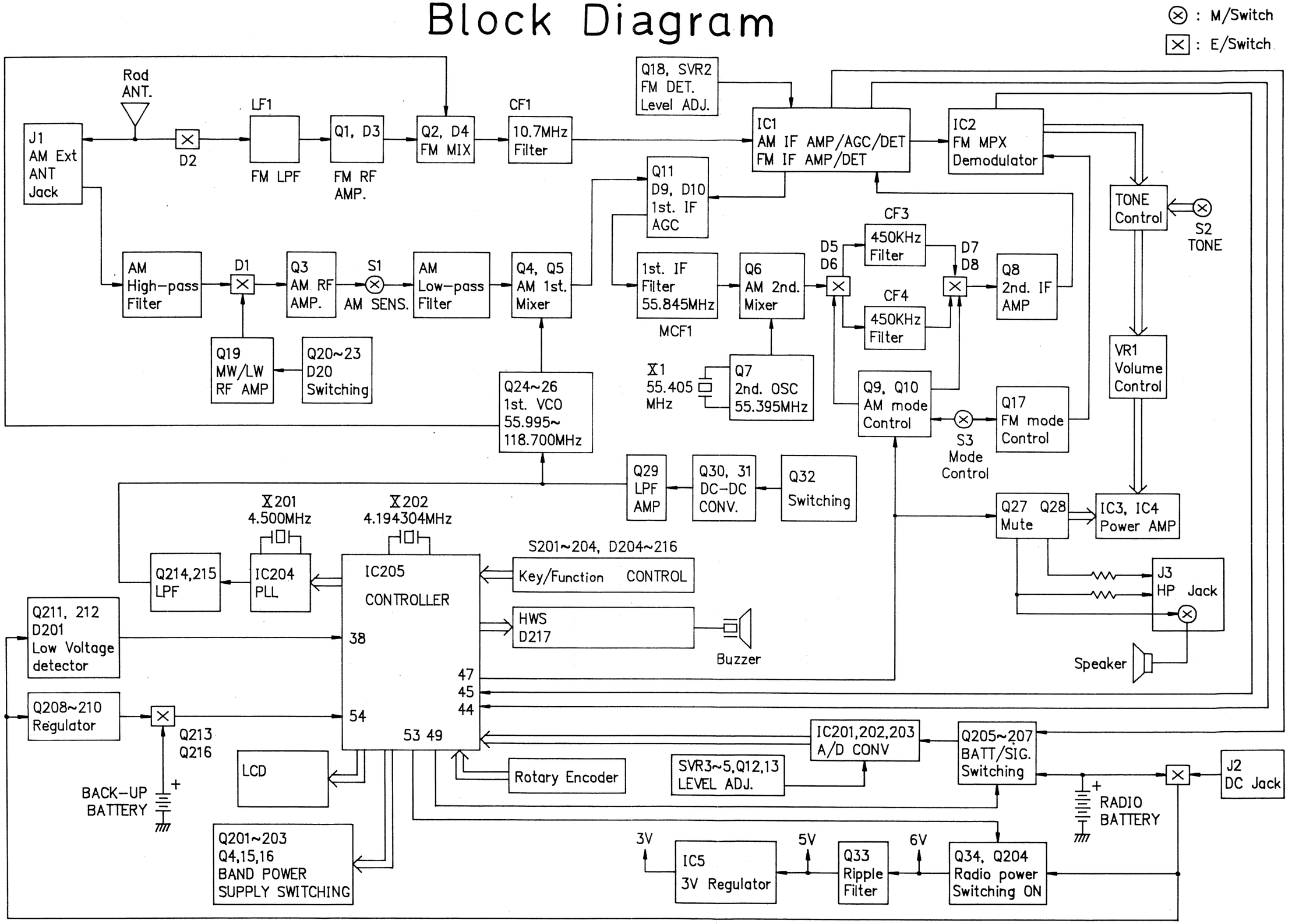
		FM	AM
Q212	E	3.22	3.22
	B	2.70	2.70
	C	3.21	3.21
Q213	E	3.00	3.00
	B	4.42	4.42
	C	3.22	3.22
Q214	S	0.93	0.94
	G	0.68	0.69
	D	2.63	2.63
Q215	E	0	0
	B	0.61	0.61
	C	9.30	1.20
Q216	E	0	0
	B	0	0
	C	4.42	4.42

Encoderplatine
Encoder p.c.b.
Ident.Nr. 73 8364



Encoder-Drehkontakte
Rotary encoder
Ident-Nr. 73 8371

Block Diagram

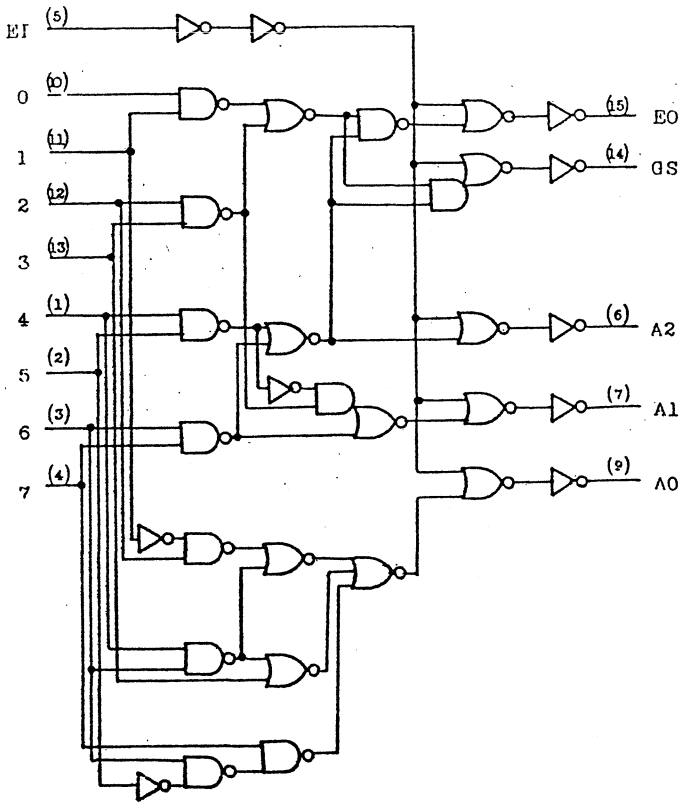


IC203 TC40H148F Schalt-IC

Wahrheitstabelle

Eingänge / Input									Ausgänge / Output				
Pin 5 (E I)	Pin 10 (O)	Pin 11 (1)	Pin 12 (2)	Pin 13 (3)	Pin 1 (4)	Pin 2 (5)	Pin 3 (6)	Pin 4 (7)	Pin 9 (A_0)	Pin 7 (A_1)	Pin 6 (A_2)	Pin 14 (GS)	Pin 15 (EO)
L	L	H	H	H	H	H	H	H	H	H	H	L	H
L	X	L	H	H	H	H	H	H	L	H	H	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	X	X	L	H	H	H	H	L	L	H	L	H
L	X	X	X	X	L	H	H	H	H	H	L	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	X	X	L	H	H	L	L	L	H
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	H	H	H	H	H	H	H	H	H	H	H	H	H
H	X	X	X	X	X	X	X	X	H	H	H	H	H

X = nicht verwendet / don't care



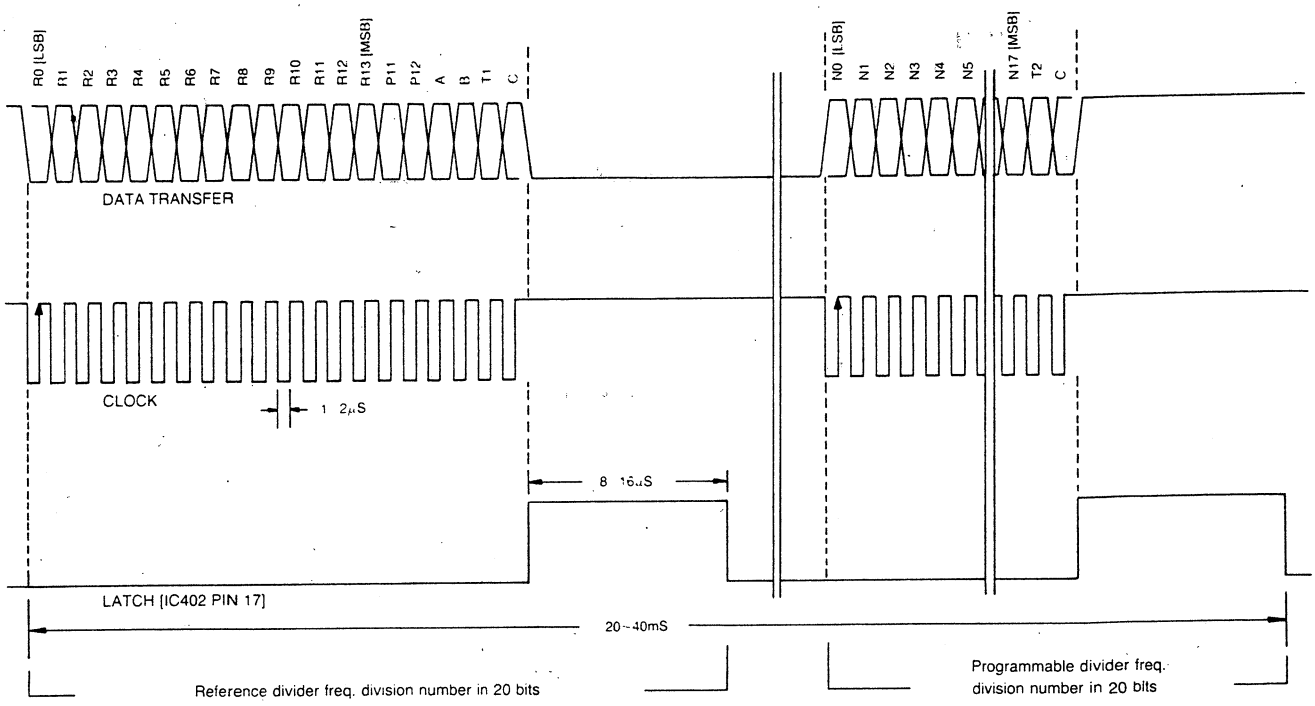
Weltempfänger RK661G4

IC204 CDX1118M-1

Pin-Nr. Pin-no.	Pin-Name Pin-name	Eing./Ausg. Input/Output	Pinfunktion	Pinfunction
1	V_{BB}		Trägermaterial, über C409 nach Masse	Substrate terminal, via C409 to ground
2	CLK	E, I	Takt für Pin 4, die Anstiegsflanken werden verwendet	Clock for Pin 4
3	LAT	E, I	Latchsignal für Schieberegisterdaten wie „up" und „down"	Latch signal for shift register data as up and down
4	DIN	E, I	Daten im 20 bit-Format und „up"-„down"-daten	20 bit frame data and up/down-Data
5	XI	E, I	Oszillatoranschluß für 4,5 MHz-Quarz	Reference oscillator terminal for 4.5 MHz crystal
6	XO	A, O	Oszillatoranschluß für 4,5 MHz-Quarz	Reference oscillator terminal for 4.5 MHz crystal
7	PD	A, O	Anschluß am Phasenkomparator, 3 Spannungszustände, AM/FM-Abstimmspannung	Phase comparator terminal (3 states) AM/FM-tuning signal
8	AO	A, O	Nicht verwendet	Not used
9	BO	A, O	Nicht verwendet	Not used
10	TVI	E, I	Nicht verwendet (180/240 MHz); Masseverbindung	Not used (180/240 MHz); ground-connection
11	FMI	E, I	FM/AM-Oszillatorfrequenz. Teilung 1/12 bis 1/262151	FM/AM-oscillator frequency. Division 1/12 to 1/262151
12	V_{DD}		Spannungsversorgung (+ 3 V)	Power supply (+ 3 V)
13	AMI	E, I	Nicht verwendet, Masseanschluß, sonst AM-Oszillatorfrequenz	Not used, connection to ground, otherwise AM-oscillator frequency
14	V_{SS}		Masse	Ground

Frequenzteilung der Referenz-oszillatorfrequenz

Frequenzteilung des programmierbaren Teilers



20 bit-Format

C = L

20 bit-Format

C = H

R0 . . R13 = Binärer Frequenzteilungswert
Reference divider frequency division number

P11, P12 Eingangspin AMI, FMI, TVI

	P11	P12
AMI-input	X	L
FMI-input	L	H
TVI-input	H	H

A, B an, on AO u.a. BO für Vorteilerumschaltung, nicht verwendet / not used

A, B, T1, T2

T2	T1	A	B	AO	BO
L	L			A	B
L	H			Signal, nicht verriegelt Unlock signal	Ausgabe der Schieberegister-daten Shift register output
H	H	L	L	Referenz-frequenzaus-gangssignal Reference divider output	Hauptteiler-ausgangs-signal Main divider output
H	H	L	H	Hauptteiler-ausgangssignal Main divider output	

Hinweis: AO, BO (Pin 8, Pin 9) nicht als Meßausgänge verwenden, wenn T1 = H

Hint: Don't use AO, BO (Pin 8, Pin 9) for external control when T1 = H

Frequenzteilung

$$N = \frac{f_{LCD}\,(kHz) + f_O\,(kHz)}{1\,(kHz)} - 8$$

N = Teilungsverhältnis, division number

f_{LCD} = LCD-Frequenz, LCD-Frequency

F_O = Oszillatorfrequenz

Beispiel 1/Example 1

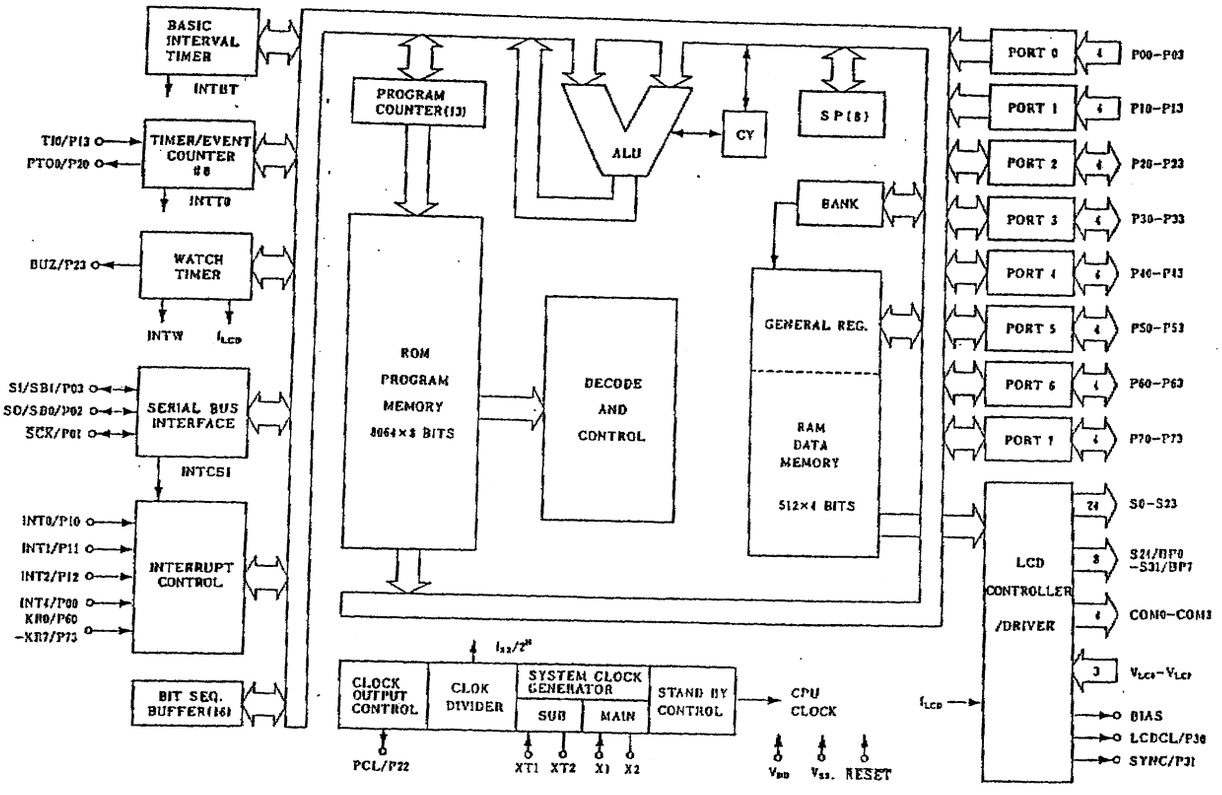
f_{LCD} = 100 MHz , f_O = 10,7 MHz

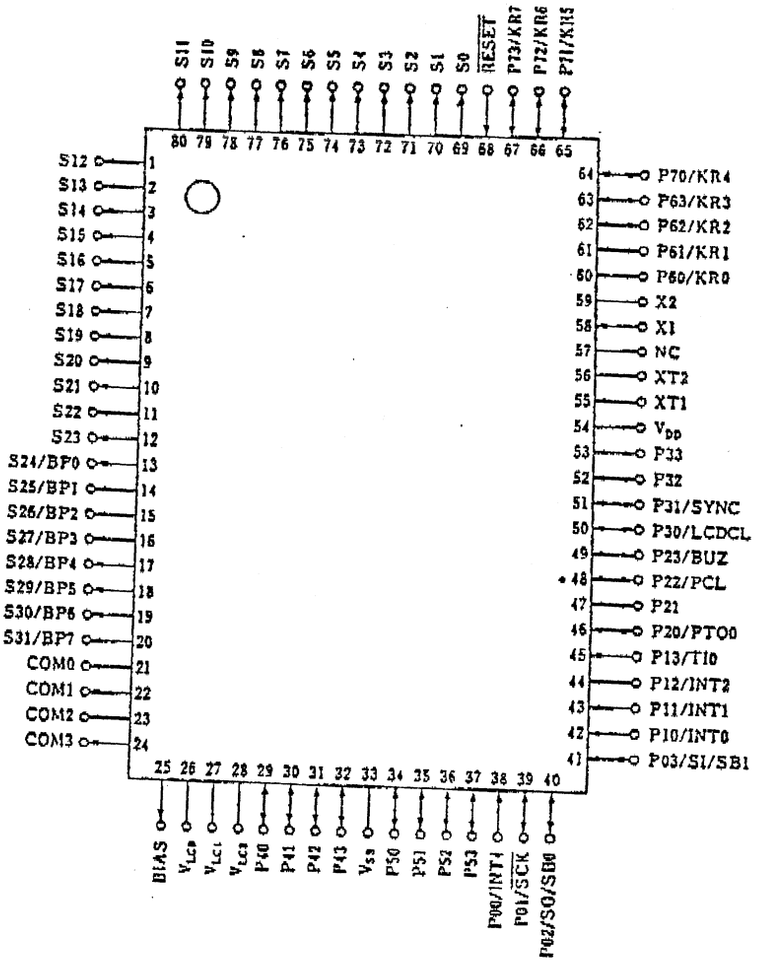
$$N = \frac{100000 + 10700}{1} - 8 = \frac{110700}{1} - 8 = 110692$$

Beispiel 2/Example 2

f_{LCD} = 10 MHz , f_O = 55,845 MHz

$$N = \frac{10000 + 55845}{1} - 8 = \frac{65845}{1} - 8 = 65837$$


BASIC INTERVAL TIMER
INTBT
TI0/P13
PTO0/P20
TIMER/EVENT COUNTER #0
INTT0
BUZ/P23
WATCH TIMER
INTW
f_{LCD}
SI/SBI/P03
SO/SB0/P02
SCK/P01
SERIAL BUS INTERFACE
INTCSI
INT0/P10
INT1/P11
INT2/P12
INT4/P00
KR0/P60
-KR7/P73
INTERRUPT CONTROL
BIT SEQ. BUFFER(16)
PROGRAM COUNTER(15)
ALU
CY
SP(8)
BANK
ROM PROGRAM MEMORY 8064×8 BITS
DECODE AND CONTROL
GENERAL REG.
RAM DATA MEMORY 512×4 BITS
PORT 0
PORT 1
PORT 2
PORT 3
PORT 4
PORT 5
PORT 6
PORT 7
P00-P03
P10-P13
P20-P23
P30-P33
P40-P43
P50-P53
P60-P63
P70-P73
LCD CONTROLLER /DRIVER
S0-S23
S24/BP0 -S31/BP7
COM0-COM3
V_{LC0}-V_{LC2}
BIAS
LCDCL/P30
SYNC/P31
$f_{XX}/2^N$
CLOCK OUTPUT CONTROL
CLOK DIVIDER
SYSTEM CLOCK GENERATOR
SUB
MAIN
STAND BY CONTROL
CPU CLOCK
PCL/P22
XT1 XT2 X1 X2
V_{DD} V_{SS} RESET


S11 S10 S9 S8 S7 S6 S5 S4 S3 S2 S1 S0 RESET P13/KR7 P12/KR6 P11/KR5
80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65
S12 1
S13 2
S14 3
S15 4
S16 5
S17 6
S18 7
S19 8
S20 9
S21 10
S22 11
S23 12
S24/BP0 13
S25/BP1 14
S26/BP2 15
S27/BP3 16
S28/BP4 17
S29/BP5 18
S30/BP6 19
S31/BP7 20
COM0 21
COM1 22
COM2 23
COM3 24
64 P70/KR4
63 P63/KR3
62 P62/KR2
61 P61/KR1
60 P60/KR0
59 X2
58 X1
57 NC
56 XT2
55 XT1
54 V_{DD}
53 P33
52 P32
51 P31/SYNC
50 P30/LCDCL
49 P23/BUZ
48 P22/PCL
47 P21
46 P20/PTO0
45 P13/TI0
44 P12/INT2
43 P11/INT1
42 P10/INT0
41 P03/SI/SB1
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
BIAS V_{LC0} V_{LC1} V_{LC2} P40 P41 P42 P43 V_{SS} P50 P51 P52 P53 P00/INT4 P01/SCK P02/SO/SB0

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Pin-Nr. Pin-no.	Pin-Name Pin-name	Eing./ Ausg. Input/ Output	Pinfunktion	Pinfunction
1	S12	A, O	Segment-Pin. Es bestehen 4 Ansteuersysteme über COM0 ... COM3 bei ⅓ der Normalspannung. Zur Ansteuerung des Displays	Segment pin. Produced with 4 COM-Systems (0 ... 3) and ⅓ bias voltage
2	S13	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
3	S14	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
4	S15	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
5	S16	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
6	S17	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
7	S18	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
8	S19	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
9	S20	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
10	S21	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
11	S22	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
12	S23	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
13	S24/BP0	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
14	S25/BP1	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
15	S26/BP2	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
16	S27/BP3	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
17	S28/BP4	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
18	S29/BP5	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
19	S30/BP6	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
20	S31/BP7	A, O	Segment-Pin zur Ansteuerung des Displays oder als Port-Anschluß verwendbar	Segment pin for control the display or port-connection
21	COM0	A, O	In Verbindung mit COM1 ... COM3 Quadriplexbetrieb und ⅓ Normalspannung	Quadriplex-operation with COM1 ... COM3 and ⅓ bias voltage
22	COM1	A, O	Wie Pin 21	As pin 21
23	COM2	A, O	Wie Pin 21	As pin 21
24	COM3	A, O	Wie Pin 21	As pin 21
25	BIAS	A, O	LCD-Spannungsregelung 6,4 V	LCD power supply bias control +6.4 V
26	VLC0	E, I	LCD-Spannungsversorgung 6,4 V	LCD power supply bias control +6.4 V
27	VLC1	E, I	Nicht verwendet	Not used
28	VLC2	E, I	Nicht verwendet	Not used
29	P10	A/E, O/I	Ausgang der Teilerdaten für PLL-IC zum IC204, 20 Bit-Format (DIN)	Output of 20 bit-frame the divider data to PLL-IC (IC204), DIN
30	P11	A/E, O/I	Ausgang, Takt für die Teilerdaten	Output, clock for divider data
31	P12	A/E, O/I	Ausgang, Latch „up" und „down"-Daten	Output, Latch data "up" and "down"
32	P13	A/E, O/I	Eingang von der Tastenfeldmatrix und vom Schalter S204	Input from key matrix and the switch S204
33	V_{SS}		Masse	Ground
34	P50	E/A, I/O	Eingang von der Tastenfeldmatrix und vom Schalter S203	Input/Signal from key matrix and switch S203
35	P51	E/A, I/O	Eingang von der Tastenfeldmatrix und vom Schalter S203	Input/Signal from key matrix and switch S203
36	P52	E/A, I/O	Eingang von der Tastenfeldmatrix und vom Schalter S202	Input/Signal from key matrix and switch S202
37	P53	E/A, I/O	Eingang von der Tastenfeldmatrix und vom Schalter S201	Input/Signal from key matrix and switch S201
38	P00/INT1	E, I	Eingang, gezielte Unterbrechung	Input interrupt
39	P01/$\overline{SCK}$	E/A, I/O	Eingang, Takt, seriell	Input, clock, serial
40	P02/SO/SBO	E/A, I/O	Eingang, seriell, Bus	Input, serial, Bus

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Pin-Nr. Pin-no.	Pin-Name Pin-name	Eing./ Ausg. Input/ Output	Pinfunktion	Pinfunction
41	P03/SI/SBI	E/A, I/O	Eingang, seriell, Bus	Input, serial, bus
42	P10/INT0	E, I	Für gezielte Kontaktunterbrechung durch Encoder-Drehkontakt	Input special interrupt by the encoder (tuning)
43	P11/INT1	E, I	Für gezielte Kontaktunterbrechung durch Encoder-Drehkontakt	Input special interrupt by the encoder (tuning)
44	P12/INT2	E, I	AM-Feldstärke	AM-field strength
45	P13/T10	E, I	Mono/Stereo	Mono/Stereo
46	P20/PTO0	E/A, I/O	Ausgang Ereignis-Zähler	Output, event counter
47	P21	E/A, I/O	Ausgang: NF-Muting	Output: AF-muting
48	P22/PCL	E/A, I/O	Ausgang Uhrentakt 524288 Hz	Output clock 524288 Hz
49	P23/BUZ	E/A, I/O	Ausgang Vergleichssignal, 2,048 kHz nicht für Alarm, Nachstimmung für Systemtakt	Output 2,048 kHz used for system clock, not for alarm
50	P30/LCDCL	E/A, I/O	Alarmfrequenz	Alarmfrequency
51	P31/SYNC	E/A, I/O	Eingang zur LCD-Synchronisation	Input for LCD synchronization
52	P32	E/A, I/O		
53	P33	E/A, I/O	Ausgang Unterbrechung der Spannung zum IC3 (Endstufe)	Output voltage interrupt to IC3 (amplifier)
54	VDD		Spannungsversorgung 8 V	Power supply 8 V
55	XT1		Mit Masse verbunden, sonst nicht verwendet	Connection to ground, not used
56	XT2		Nicht verwendet	Not used
57	NC		Nicht im IC angeschlossen	Not connected inside the IC
58	X1	E, I	CPU-Takt 4,194304 (Quarz), Quarzanschluß	CPU-clock 4,194304 (Quarz), quartz
59	X2		CPU-Takt, Quarzanschluß	CPU-clock, quartz
60	P60/KR0	E, I		
61	P61/KR1	E, I	S201, Radio/HWS	S201, HWS/Radio
62	P62/KR2	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
63	P63/KR3	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
64	P70/KR4	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
65	P71/KR5	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
66	P72/KR6	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
67	P73/KR7	A, O	Signal zur Tastenfeldmatrix	Signal to key matrix
68	$\overline{\text{RESET}}$	E, I	Resetsignal (V_{DD})	Reset (V_{DD})
69	S0	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
70	S1	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
71	S2	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
72	S3	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
73	S4	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
74	S5	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
75	S6	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
76	S7	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
77	S8	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
78	S9	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
79	S10	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display
80	S11	A, O	Segment-Pin zur Ansteuerung des Displays	Segment pin for control the display